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ORBIT 27



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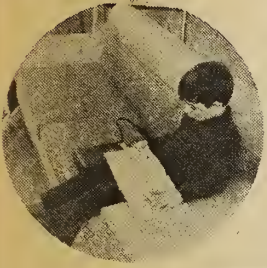
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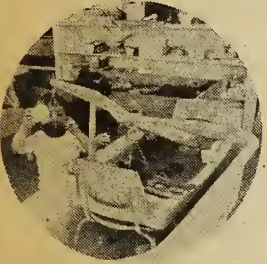
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THE



SPACED-IN



CLASSROOM



IN EARLY



CHILDHOOD

Christine Nash
OISE Midnorthern Centre

*The present article is a follow-up of
'Thinking about Time in Early Childhood'
by Christine Nash, published in Orbit 25.*

The Young Child's Behavior — Spaced-Out?

When we try to describe the characteristic classroom behavior of young children, several phrases come to mind. We can say that they are 'distractible,' that they move quickly from one activity to another. A positive way of describing distractibility is to say that the child attends in rapid succession to many different things. Perhaps

to talk about a 'short attention span' is the same thing. The child attends only to tasks that require little time to complete, or if he attempts a longer task he will not finish it. (Other people mean that the child does not sit and listen to an adult for a long period of time, but this is a rather restricted use of the term.) The child who has had any encouragement at all to express his sense of wonder or curiosity is interested in almost everything he does. He wants to know how things work. He wants to know why things happen. In his attempts to discover he may seem destructive because he takes the most direct route to finding out. In this superficial way we may describe the characteristic behavior of the children we see in early childhood programs.

The young child has a great longing to understand his world. In conversation we notice that he longs to make connections, but often they are not useful ones that truly help him to find a meaningful pattern. He tries very hard to place new experiences in the field of his own past experiences, or to relate new events to past ones in a fairly organized way:

'Miss, I saw a fire engine on Sunday.'

'Miss, there was a fire at my Grandma's last summer.'

'Miss, my Grandma is coming to stay tomorrow.'

A sequence of comments such as this shows that they are trying to connect events, but the result is still far from being logically coherent.

And Spaced-Out Classrooms?

In many junior kindergarten and kindergarten classrooms it seems that distractibility, and a tendency to move aimlessly from one activity to another without any building of learning or making of connections, is reinforced.

Listen to this 5-year-old child who has just found out something in the sand. He talks aloud expressing his every thought to himself: 'I just found out that these [two small white] pots of sand go into this [single larger clear] bottle. They fill it. When I pour the sand back, they [the two small containers] are filled again. I wonder what happens if I try that with water instead of sand. I am going to see. The water is over there [across the room]. I can take the pots and bottles over to the water. Hey, that looks like a good game Jack and Leslie are playing here with the big blocks. Let's put the pots and bottles up there. Now they are chimneys. Let's put another wall over here . . .'

What happened? He decided to try something new, but could not attend to the task for long enough to cross the physical space between two potentially complementary learning areas. The block play distracted him by its position in the room. The arrangement of the room let different activities compete with each other instead of supplement each other. Does the early childhood classroom by its very nature have to reinforce natural distractibility? What could have happened if the sand and water areas were adjacent? (I mean, after two days of muddy water and wet sand.)

Space — The Second Dimension of the Learning Environment

The knowledge that young children learn through activity, in small (*not* large) groups, and develop task orientation through the freedom to work as long as they wish, leads to the choice of a learning center approach. The next question is — which learning centers? One could begin by choosing whatever is fashionable, or taking what is on the board's supply list. But this can lead to other problems. So we took Steele's statement to heart: 'The process by which physical settings are structured is, in many cases, a more powerful influence . . . than is the actual shape of the structure.' We decided to evolve a process whereby the early childhood classroom space can be structured purposefully.

The process and its outcomes can be described briefly. The groups of teachers devising and using the space plan did so in five steps.

Step 1: Expressing philosophies and the general objective — 'the provision of opportunities for each child to develop or grow to his potential in each area of development in such a way that he experiences joy in such development.'

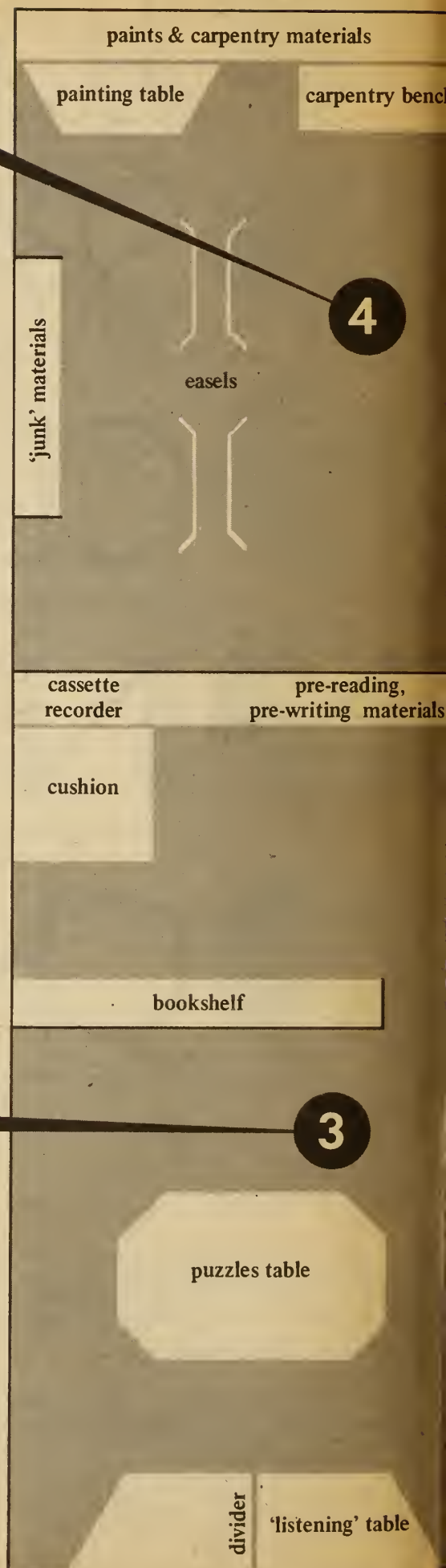
Step 2: Making the general objective specific in terms of knowledge of child development and ways of learning. We

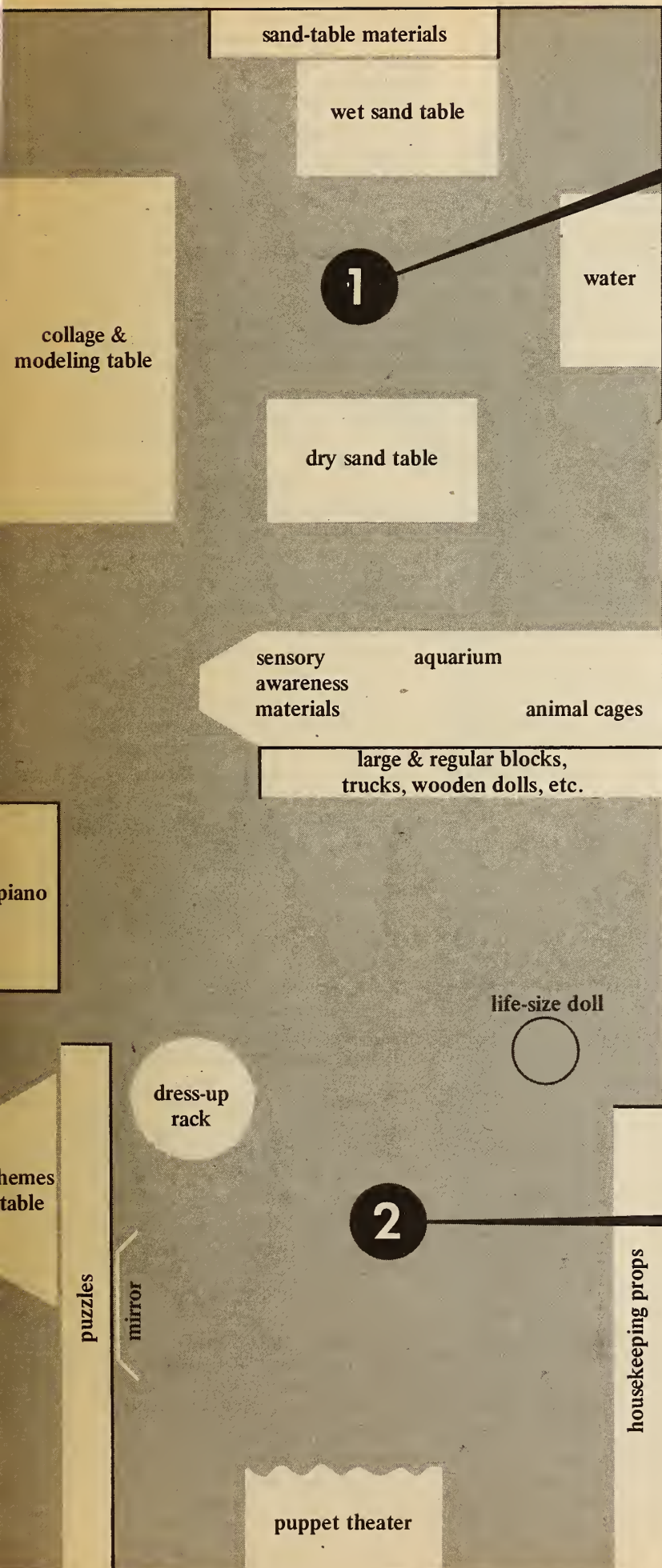


CREATIVE



QUIET ACTIVITIES





1



NUMBER AND SCIENCE

5

vehicles,
large equipment,
and bean bags



GROSS MOTOR

2



ROLE-PLAYING

The photographs were taken at St. John RCSS in Garson, near Sudbury, where the author is conducting an experimental junior kindergarten program.

tried to answer the question 'What are the ways a child is growing to develop his behavior in early years?' The answer was phrased as a chart of aspects of physical, cognitive, and emotional development, accompanied by brief descriptions of ways of learning.

Step 3: At this point the process became interesting educationally as we asked, 'How does the child development chart translate into aspects of early childhood programming?' We recognized that some aspects are covered directly through specific learning centers, while others are covered through the very provision of such centers inasmuch as they promote social interaction and the development of language skills. Then the classroom requirements — space, materials, equipment — were listed alongside the aspects of child development. Since some activities relate to more than one aspect, that list could be condensed to one of basic learning centers according to activities and the necessary materials or equipment. So we decided what to put in the classroom.

Step 4: Looking at the child's behavior. The most frequent descriptors were 'distractible,' 'looking for connections,' 'searching,' 'curious.' These can be related to Piaget's descriptions of the young child's view of the world as a series of separate events. Things are the way they look. Events occur separately; they are not yet linked by the process of understanding relationships through experience. More significant is Piaget's explanation of the way the child grows toward logical thinking — through repeatedly experiencing actual connections between related things or groups.

Step 5: Bringing together the broad spectrum of learning activities or experiences into a spatial arrangement in which distractibility is reduced. The result is the space plan illustrated.

Why Learning Centers?

The main reason for grouping activities is to develop very fully the learning potential of each piece of equipment by positioning it near to others with related learning objectives. In this way distractibility is actually put to use, for what attracts the child's attention can add to his present activity rather than replace it. The activities are grouped according to a primary aim, but this does not preclude secondary uses for activities, such as classifying in collage or creating with blocks.

The arrangement helps the child to relate his ideas and activities from one material to the next. He gains a sense of satisfaction because he is more easily able to understand just what he is doing in school. As the range of his activities increases he naturally grows to feel more competent — 'I like this classroom. You know where you are here.'

For the teacher there is grouping according to clean and messy activities. With the creative area and the science and

number area both at one end of the room, the other can be kept relatively clean and tranquil for the quiet activities and role-playing activities.

The grouping is also helpful to paraprofessionals or parents in the classroom. Because of the very design they can identify the primary aim of an activity simply by establishing where it takes place. Parents working in this type of classroom have commented on the increased confidence they feel in assisting the teacher.

Scheduling of new materials is easier. New activities can be planned in a cyclical fashion for different areas. It quickly becomes obvious to the teacher if any part of the program is insufficiently challenging, too difficult, or just plain dull.

Observer Assessment

Observations of children working in classrooms using a space arrangement based on this plan support the assumption that the child's experiences are enhanced by it. The use of materials in creative work was the subject of many comments by observers. The verification of basic science and number facts using dry sand and water occurred frequently. (This rarely happened in rooms where sand and water were farther apart.) Role play and block play were more advanced. The 'quiet activities' were carried to completion far more frequently than in settings where they were less well placed to promote concentration.

It was suggested initially that if children were given the freedom to choose, a large proportion would not choose at all. So we spent a lot of time watching what the children did at the beginning of the year and later. Until November, many children stuck with one or two activities — either because they had had previous experience of them, which gave them security, or because freedom to indulge in a messy activity was an exciting novelty. Later in the year most children worked at all the activities at some time or other, some always looking for new materials, others watching for a while before participating.

Parent and Teacher Comments

This year the space plan has been tried by teachers in parent cooperatives. After explaining the decision to implement rational space planning, Jean Kuz, a parent at Capreol Co-operative Nursery School, comments:

'We also at this time decided to increase our enrollment from 20 to 23 children, and I was concerned about this. With 20 children in the room in the past, the room seemed filled to overflowing and the kids at times seemed to get out of hand.'

'Surprisingly enough to all of us, with 23 in the room, the effects of the new arrangement were easy enough to see. The 23 kids were all busy. Their flow of tasks from one center to another went so smoothly that many mornings I took unnecessary headcounts to make sure I wasn't missing

a few. The noise level was reduced and the play much more involved.'

'In the dress-up center, the kids began to involve the blocks in their role-playing. For example, after building a structure of blocks and wearing a hard hat, the child would proceed to change roles to train conductor (by turning in his hat for another) and help his passengers onto the train.'

'The creative activities area was the most noticeably improved. After making a collage the kids now went on to add paint and other things to it. Some carpentry works were also pasted upon. The collage materials were also put to good use at the play-dough table — straws became antennae, toothpicks became arms and legs.'

'All of this was brought about not by prompting or suggestions from the parents or teacher but by the proximity of the related centers. It's a wonderful thing to see the pride and joy of a child who has successfully taken his work from one center to another and completed his task to his satisfaction.'

'This room arrangement has taken the load from the teacher of planning large-group activities. She now has the time and space to be able to work more closely with individual children; to get involved in their play and to be available where and when she is needed.'

The teacher, Gail Crawford, summed up her observations:

'Firstly, each child appeared to be more comfortable and knowledgeable of his surroundings and the equipment in the room. More important, I observed more coherency in their play and a longer period of time spent in each area. I found that the children have expanded their skills and their interest and have increased their attention span.'

'I have found by the coordination of areas the children spend much more time in each area and the range of activities they do and discoveries they have made has greatly broadened. They have developed the ability to correlate materials in a more interesting and creative way.'

Conclusion

This process of developing a space is an important one in that it provides part of the framework for the early childhood program. Two other elements of the framework — communication between people and the constructive and satisfying use of materials — both become easier within the context of well-planned space.

Note: The development of the Learning Environment Space Plan and its evaluation were part of a junior kindergarten project undertaken jointly by the OISE Mid-northern Centre and the Sudbury District Roman Catholic Separate School Board. The room made available by the Board made the observation of children at work in an ideal space possible, and the co-operation of the teacher, Joyce Kolibash, was very much appreciated.

Self-Destructive Behavior

Marshall Wilensky, OISE

There is a growing literature of doom concerning the future of the human race. Predictions of catastrophe multiply in the face of overpopulation, pollution, and bankruptcy of natural resources. Rather than attempting to view the situation in its global context, we shall look at it in terms of its effect on groups of individuals. Fromm in *The Sane Society* argues that a whole society may suffer from social mental illness so severe that the societal norm is actually a pathological state:

'That human nature and society can have conflicting demands, and hence that a whole society can be sick, is an assumption which was made very explicitly by Freud, most extensively in his *Civilization and Its Discontents*.'

If society functions counter to man's needs, even the social conditioning process will fail to make the denial of



Drawing by Michi Moriyama, a grade 13 student at Jarvis Collegiate Institute, Toronto

personal fulfillment acceptable to everyone. Most people will cope through pathological adjustment, some will take counter-cultural action, and some will seek escape in various forms of destructive action. As Paulo Freire states in *Pedagogy of the Oppressed*:

'If children reared in an atmosphere of loneliness and oppression, children whose potency has been frustrated, do not manage during their youth to take the path of authentic rebellion, they will either drift into total indifference, alienated from reality by the authorities and myths the latter have used to "shape" them; or they may engage in forms of destructive action.'

The true dropouts from a society are not those who separate themselves from the culture in search of alternatives but those who destroy a component of that society — either themselves or others.

Suicide

Suicide is, of course, the most obvious manifestation of self-destructiveness. Rather than attempting to examine the suicide rate per se, let us examine the change in its overall percentage makeup, with special attention to the 15–24 age group. United States statistics covering the period 1953 to 1963 show increases in suicides in this age group of 35% for white males, 45% for white females, 82% for nonwhite males, and 81% for nonwhite females. Among the young, suicide is the second most common cause of death. In the United States approximately 70,000 to 80,000 young people (15–24) will attempt suicide in the next twelve months and between 3,500 and 4,000 will succeed. In Canada, the total number of suicides in this age group increased over 95% between 1965 and 1972. In the United States an increase of 97% occurred between 1959 and 1969, and in Sweden an increase of 146% took place between 1955 and 1970.

It is widely considered that suicides and attempted suicides represent separate and different phenomena. All suicide statistics are open to question, but suicide attempt statistics are particularly unreliable. Notwithstanding reservations, Metropolitan Toronto police statistics do show differences in the demographic profiles of 'successful' and 'unsuccessful' suicides. While 14% of suicides are in the 16–24 age range, 30% of attempted suicides are also from this group, with almost 25% being between 19 and 24. The 50–54 age group has 17.5% of suicides but accounts for only 5.2% of attempted suicides. Between 1965 and 1973 the number of suicides almost

doubled while the number of attempted suicides decreased. The male to female ratio of 2:1 persisted, but the reverse ratio of attempted suicides no longer held.

Statistics on suicides are not easily obtained; some of the deaths attributed to accidents and violence may actually be suicides. Motor vehicle accidents are common among young drivers, particularly males under age 25, and a suicidal element may be involved in many of them. Also, significant changes have been identified in the age pattern of violent deaths resulting from other than traffic accidents. Poisonings, drownings, and falls rank high among these. In Canada, between 1950 and 1972 such deaths in all age groups doubled; but in the 15–19 age group and in the 20–24 age group the numbers more than quadrupled and tripled respectively. Similar trends are apparent in American, British, and Swedish statistics, although changes in the classification system for cause of death made after 1964 make comparison difficult. Such deaths may be accidents, but their concentration in a particular age group leaves the matter open to question. And it is difficult to understand how someone over the age of 15 could accidentally drink a bottle of lye.

Alcohol and Drug Use

A no less dramatic indicator of escape activity in a dehumanizing society is the widespread use of awareness-altering drugs. In our society, the most popular drug is alcohol, the hazards and deleterious effects of which are well known. Since alcoholism doubles the chances of premature death, it is probable that a significant number of alcoholics have

"The true dropouts from a society are...those who destroy a component of that society—either themselves or others"

subconscious suicidal tendencies.

The increase in alcohol use among young people has, however, failed to arouse the public concern that attaches to the use of other drugs. A report of a 1972 study by the Addiction Research Foundation comments:

'Three years ago when we reported that almost 20% of our high school students had tried marihuana, parents and school officials reached the edge of panic. A few months ago when we reported that almost 80% of high school students drank alcohol, and many of these were drinking frequently, there was one collective yawn.'

In the United States from 1969 to 1972 the increases in junior and senior high school students who had used alcohol were 33% and 90% respectively. In Toronto, high school student drug surveys of 1968, 1970, and 1972 show a tremendous increase in the use of alcohol. The proportion of student nondrinkers has decreased from 53.7% to 29.4%, and those drinking four or more times a month have increased from 7.5% to 23.3%. Because alcohol-related illnesses develop slowly, data on their incidence among students cannot be obtained. But the Le Dain Commission on Non-Medical Use of Drugs, the United States National Commission on Marihuana and Drug

Table 1/Suicides by Age Group, Canada, 1945–72 (percentages)

Age	1945	1950	1955	1960	1965	1970	1972
< 14	0.7	0.3	0.2	0.4	0.9	0.7	0.9
15–19	2.9	3.4	1.9	3.3	3.8	6.0	7.7
20–24	6.3	6.0	4.2	6.4	6.7	10.6	12.5
25–29	6.7	6.0	7.7	9.0	6.7	8.6	10.7
30–34	8.2	6.2	8.2	9.1	8.2	8.1	8.2
35–39	9.6	8.5	8.4	8.8	9.7	9.6	8.5
40–44	10.5	11.0	11.3	8.7	10.7	10.4	10.2
45–49	9.3	10.5	10.5	11.0	9.6	10.7	9.8
50–54	10.3	10.5	10.5	10.2	11.8	9.2	9.2
55–59	10.1	9.3	9.4	9.4	9.7	8.7	7.4
60–64	9.4	10.0	9.9	8.1	8.2	6.2	5.4
65–69	6.7	8.1	7.2	5.5	5.4	4.8	4.1
70+	9.3	10.2	10.6	10.1	8.2	6.4	5.5
Total number	764	1,060	1,103	1,350	1,715	2,413	2,630

Table 2/Illicit Narcotic Drug User Population* by Age Group, Canada, 1962-72 (percentages)

Age	1962	1964	1966	1968	1970	1972
<20	0.4	1.0	0.5	0.9	4.1	7.6
20-29	24.4	30.1	27.7	26.9	30.5	43.7
30-39	33.7	32.2	31.3	31.8	28.0	20.1
40-44	17.4	16.0	17.3	17.0	14.8	10.4
50-59	9.8	8.8	8.8	8.5	6.3	4.1
60+	4.5	3.4	4.1	4.0	3.2	2.4
unknown	9.8	8.5	10.3	10.9	13.0	11.7

*Illicit includes all cases where a record shows the person's source to have been initially illicit. Not all of these persons have been convicted under the Narcotic Control Act.

Abuse, and the Canadian Medical Association independently concluded that alcohol misuse is by far the greatest drug problem in North America.

The drugs that have provoked the greatest reaction are those most commonly used illegally. In Canada, users of narcotics (excluding marihuana) increased by 58% between 1964 and 1970.

Table 2 shows the changes in the demographic profile between 1962 and 1972. Particular attention is drawn to the increases in the under-20 and 20-29 age groups.

Abuse of drugs other than alcohol has led to an overrepresentation of young people in treatment centers. In 1971, 90% of new patients other than alcoholics at the Addiction Research Foundation of Ontario were under the age of 29.

In France, a drug use survey of the

lycées showed that among 15- to 20-year-olds, 32% smoke regularly, 19% take drugs for insomnia or nervousness, and 9% drink regularly. Results of a study of drug use in Toronto appear in table 3. While this table shows only 'ever used' information, data on intensity and frequency of use show an ever younger shift in the use of depressants and tranquilizers and an increase in multiple-drug or polydrug use in conjunction with alcohol.

Experience with cannabis appears to have leveled off in most age groups, although in the 18-21 age group during 1971/72 sometime users increased from 40% to 55%. In Toronto, marihuana was the only illicit drug to increase significantly between 1968 and 1972. In that period, the number of students using marihuana seven or more times per six months increased five times.

The use of drugs by the young does not appear to be a mere fad. It is present in steady numbers and at decreasing ages. The extensive use of depressant or tranquilizing drugs is indicative of major conflicts and tension. Dr. G. L. Klerman, in an address to the American Psychiatric Association, said, 'Indeed, given the levels of neurotic distress, the wonder is that more drugs are not used.'

Mental Illness

In a discussion of the sanity of a society, mental health statistics have a place. In Canada between 1955 and 1963, 'disorders usually associated with childhood showed an increase in number of patients on books. Rates for patients in the 20-29 age group fluctuated until 1958, and then increased in successive years for both sexes. This increase is not due to more psychotics in the age group remaining on the books; it must be attributed to an increase in the mental defectives, psychoneurotics, alcoholics, pathological personalities, and other

character and behavior disorders' (Statistics Canada, 1966). Between 1965 and 1970, first admission to mental hospital increased by 63% in the 10-19 age group and by 24% in the 20-24 group, while a decrease was apparent in other age groups.

Comments

Statistics on the matters dealt with in this article are not easily obtained, and care must be exercised in their interpretation. The caveats concerning suicide statistics referred to earlier have much significance. Many suicides are simply not reported as such out of shame or expedience; many are attributed to other causes because of the religious or social stigma involved or because life insurance companies refuse payment to beneficiaries where suicide is certified.

Other inaccuracies arise from official failure to acknowledge deaths precipitated by a patient's refusal to accept life-prolonging treatment or caused by a 'deliberate accident.' Comparisons involving international statistics may have little validity because means of acquiring and categorizing data vary from country to country and because there is an inevitable time lag in their publication.

Obviously, only those drug users that report themselves in questionnaires or come to the attention of the authorities appear in statistics with any validity. Estimates of alcoholism based on a formula related to the incidence of cirrhosis found in autopsies appear valid but mainly as an indicator for the general population rather than any particular age group.

The change in numbers of people receiving mental health care may represent a change in public attitude. It is possible that just as many people were disturbed formerly but, because of the stigma attached to mental disorders, few sought treatment. But today's young people are more open and have a generally positive attitude toward therapy.

The statistics, even after factoring out population growth, seem to indicate increases in the incidence of various forms of personality destruction. Such measures are, however, the crudest indicators of social pathology because only those people whose frustration has become intolerable show up in statistical tables. Young people on the threshold of adult society are sensitive observers because they are on the brink of commitment. If society appears to them dehumanizing, they may become alienated and destructive. It does not augur well for society when social fatalities among its youth multiply.

Table 3/Rate of Drug Use by Toronto Students, 1968, 1970, 1972 (percentages)

	1968	1970	1972
Alcohol	46.3	60.2	70.6
Tobacco	37.6	35.5	38.3
Marihuana	6.7	18.3	20.9
Glue	5.7	3.8	2.9
Other solvents	*	6.3	6.5
Barbiturates	3.3	4.3	18.2
Opiates	1.9	4.0	4.0
Heroin	*	*	1.9
Speed	*	4.5	3.3
Stimulants	7.3	6.7	6.4
Tranquilizers	9.5	8.8	10.2
LSD	2.6	8.5	6.4
Other hallucinogens	2.0	6.7	7.2
Total students	6,447	6,890	6,641

*Data not collected in these years.

Use is defined as at least once in last six months. Grades range from 7 to 13.

WHAT STUDENTS THINK ABOUT OPEN-AREA SCHOOLS

T. E. Giles, University of Calgary
and
G. D. Tedrick, Yellowknife Public Schools

Few of the many studies of open-area elementary schools have considered what the students think about them. Generally such research is confined to teachers' perceptions of the situation, although a few, notably Ledbetter (1969) and the Metropolitan Toronto School Board study (1972), have included student opinion. The study on which this report is based, conducted in Calgary by Tedrick in 1973, concentrated on the perceptions of students at the grade 6 level.

Research on open-area facilities to date has produced a predominantly positive response with some negative reaction appearing from time to time. A study conducted by Kruchten in 1971 revealed that 74% of his subjects found noise a problem — a situation that supported Cheek's findings in 1970 and concurred with those of the Metropolitan Toronto School Board study. But while the literature on the subject makes reference to visual distractions, research findings have not indicated that they are a serious problem.

Design of the Calgary Study

The design of the questionnaire used in the Calgary study sought to determine the extent of visual and noise distractions suffered by students in open-area schools, to identify the most desirable and most undesirable aspects, and to assess student reaction to certain specific physical features. The questionnaire was validated and its reliability established by

applying the Alpha Coefficient of Reliability to the results of a pilot run. The subjects consisted of one randomly selected open-area grade 6 class from each of 29 public and separate schools in Calgary. The findings are based on replies received from 823 students.

Data Analysis

Table 1 summarizes the response of the students on five items related to disturbance from noise, and table 2 provides a similar summary of four items related to visual distractions. If the 'a lot' and the 'sometimes' responses are both considered, noise distractions do indeed bother many students and are a considerable problem for some. Visual distractions bother far fewer, but a small but significant minority report being bothered 'a lot.'

In the next part of the questionnaire the students were asked to indicate to what extent they agreed with given statements about certain features of their school. Table 3 lists these statements and gives a summary of responses. These responses indicate that the students approved of most of the features mentioned, particularly the carpeting, the lighting, and the library. The strongest discontent was with the lack of windows and storage space.

Other factors were investigated to determine whether they had any significant effect on the responses — sex, number of years in an open-area facility, and type of school (open-area or partly open-area, and public or separate system). In items showing a significant difference between males and females, the males were less supportive of the open area than were the females. As regards years spent in the open area, students in their second year

were more supportive than any others. Students beyond that period tended to feel that there were too many pupils in the school.

In items on noise distraction, students from partly open-area schools experienced more annoyance than did students from fully open-area schools. Students from the partly open-area schools were less concerned about windows, walls, the location of the library, and the number of students in the school.

The students listed as the most desirable features of the open area:

1. the carpet,
2. the library,
3. the open area itself,
4. the architectural design,
5. the gymnasium.

As the most undesirable features, they listed:

1. noise,
2. desks provided,
3. lack of windows,
4. small size of the gymnasium,
5. the open area itself.

It is interesting to note that the gymnasium and the open area are listed in both categories.

Discussion

The finding that noise was a disturbing factor to students in open areas supports the findings of Cheek, Kruchten, and the Metropolitan Toronto School Board. However, the conclusions reached are different from those of Kyzar (1971) and Kaelin (1971) as to what noises are distracting and to what extent. In his 1971 study of the noise factor, Brunetti found that 'teachers were bothered by noise to a

much greater degree than students were.'

Findings with regard to visual distractions are similar to those of the studies referred to earlier: visual distractions are a problem for a minority of students, but a minority that should not be ignored.

The Metropolitan Toronto School Board study reported a high degree of user satisfaction with the open-area facility. Ledbetter's study three years earlier had reported similar satisfaction, citing specifically that the students liked the carpet, the temperature levels, the easy access to the instructional materials center, the size of the open area, and available storage space.

The Toronto study indicated that teachers accept the limited window space typical of open-area facilities more readily than do students. The current study supports the Toronto one: students do not like the scarcity of windows.

The differences between replies from students in totally open-area schools and those in partly open-area schools raise a question as to how much open space there should be in an elementary school. So far, research has not determined the optimum amount. Distractibility levels differ, and even though most students, teachers, and administrators appear to favor open-area schools, the welfare of easily distracted pupils and teachers must be considered. Further research into the effect of open-area schools on these people is needed before any definite pronouncement can be made.

References

Brunetti, F. 'Open Space: A Status Report.' Stanford University, 1971.

Cheek, R. E. 'The Opinions of Teachers Teaching in Selected Open-Space Elementary Schools.' Unpublished doctoral dissertation, Wayne State University, 1970.

Kaelin, W. C. 'Open Space Schools: Advantages and Disadvantages as Perceived by Teachers and Principals in Selected Open Space Schools.' *Dissertation Abstracts*, March 1971.

Kruchten, R. M. 'A Survey of Teachers' Perceptions of Open Area Schools.' Unpublished master's thesis, University of Calgary, 1971.

Kyzer, B. L. 'Comparisons of Instructional Practices in Classrooms of Different Design.' Northwestern State University, 1971.

Ledbetter, T. A. 'A Study of Open Spaces for Teaching.' Unpublished doctoral dissertation, University of Tennessee, 1969.

Metropolitan Toronto School Board. 'Study of Educational Facilities, E5: Academic Evaluation, an Interim Report.' Toronto, 1972.

Tedrick, G. D. 'Pupils' Perceptions of Open Area School Facilities.' Unpublished master's thesis, University of Calgary, 1973.

Table 1/Percentage Distribution of Student Reaction to Noise Distractions

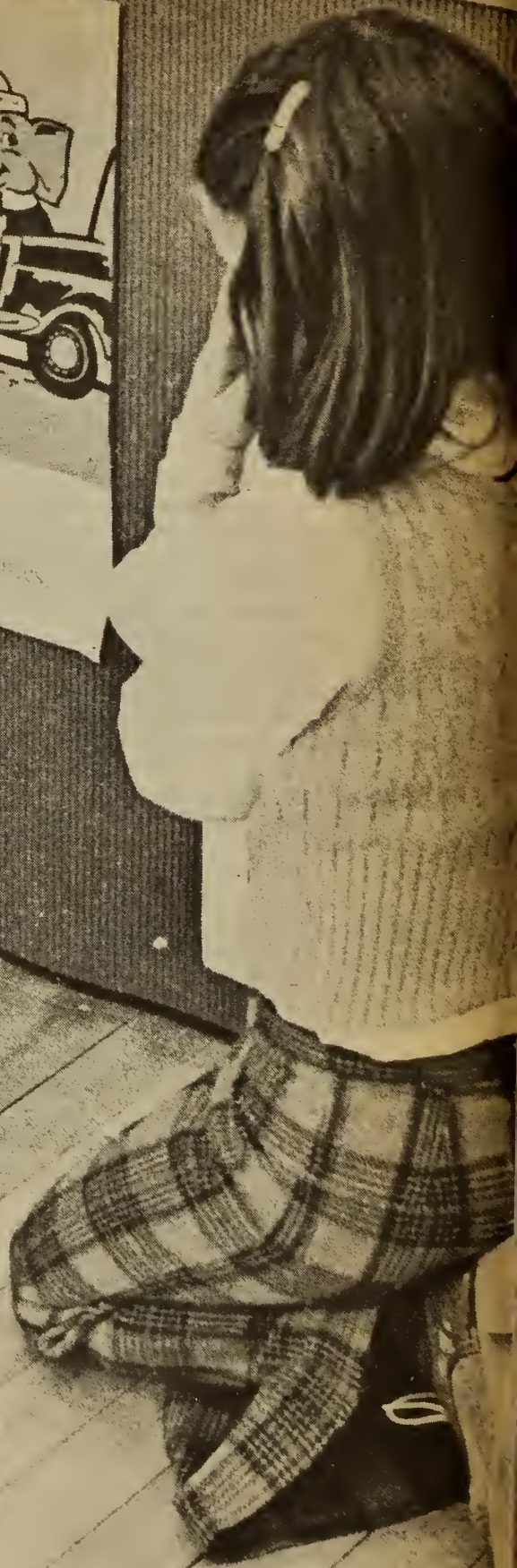
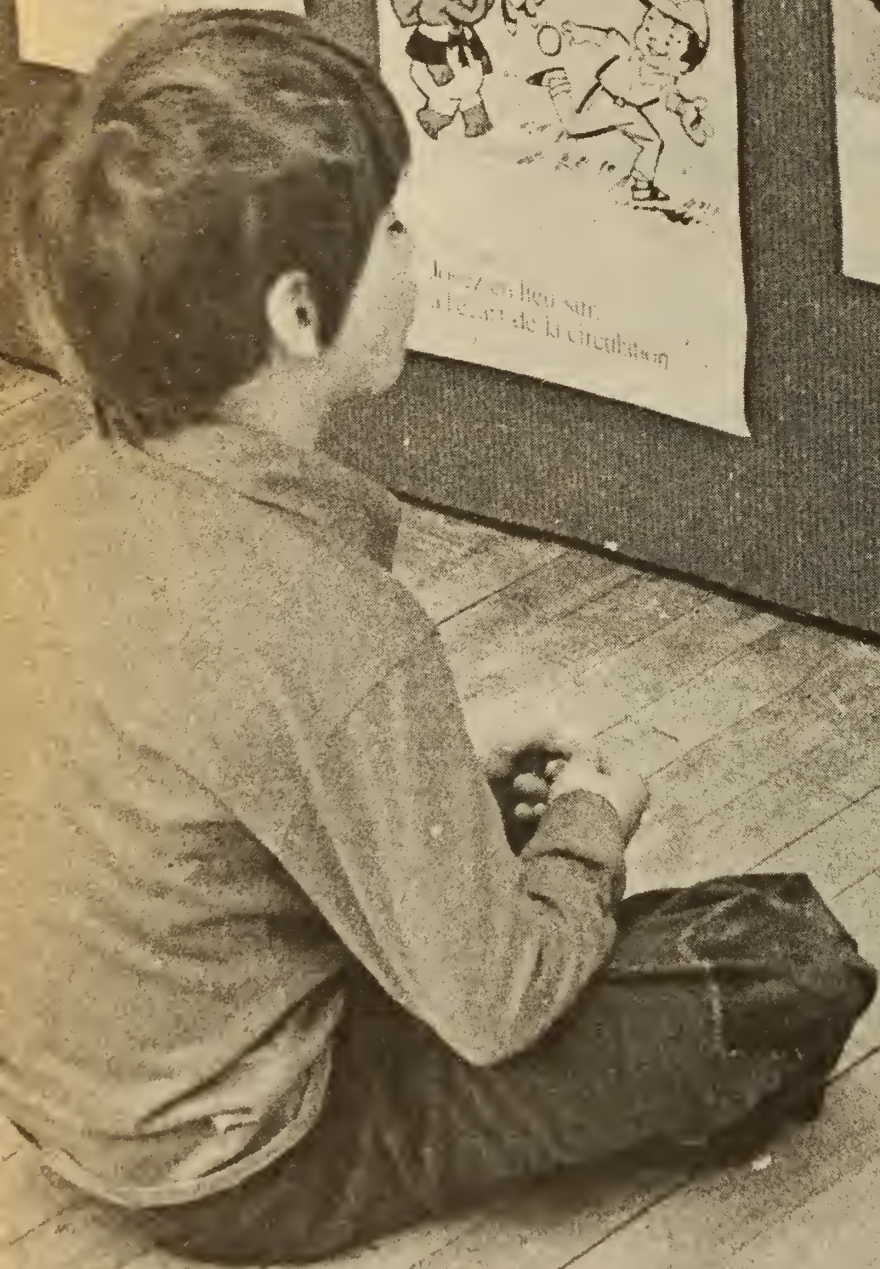
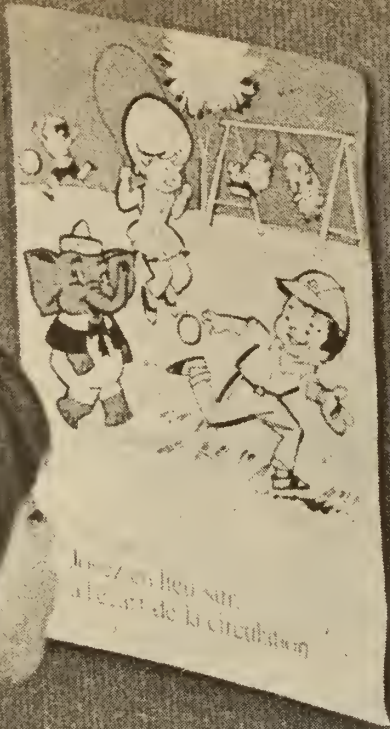
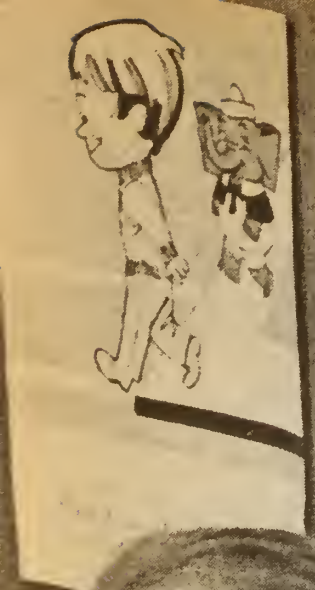
Source of Distraction	Response Category			Total
	A lot	Sometimes	Not at all	
1. Teachers talking to other groups	6	61	33	100
2. Pupils talking in other groups	15	55	29	99
3. The <i>sound</i> from a film for another group	16	47	37	100
4. The <i>sound</i> from a TV program for another group	11	39	51	101
5. Another group singing or having music	19	32	48	99

Table 2/Percentage Distribution of Student Reaction to Visual Distractions

Source of Distraction	Response Category			Total
	A lot	Sometimes	Not at all	
6. Seeing other pupils walking around in the school	8	17	75	100
7. Seeing visitors walking around in the school	6	32	62	100
8. The <i>picture</i> from a film for another group	7	37	55	99
9. The <i>picture</i> for a TV program for another group	5	32	63	100

Table 3/Percentage Distribution of Student Response to Environmental Characteristics

		Response Category			Total
		Agree	Agree somewhat	Disagree	
10.	This school should have (more) windows	41	30	29	100
11.	There should be walls between the group spaces	17	22	61	100
12.	This open area space is too big	3	7	90	100
13.	There is enough storage space for students in their desks	33	25	42	100
14.	The lighting in the school is very good	79	16	5	100
15.	I like having carpet on the floor of the school	91	6	3	100
16.	The library is very well located in this school	82	12	6	100
17.	The temperature level in the school is very comfortable	40	43	17	100
18.	There are too many pupils in this school	13	25	63	101



More about Primary French Immersion Classes

Merrill Swain
Modern Language Center, OISE

The present article is a follow-up on 'French Immersion Classes: A Promising Route to Bilingualism,' by M. Swain and H. C. Barik, published in Orbit 16.

The demand for English-French bilingual education in Ontario and across Canada is to a large extent taking the form of a demand for French immersion classes beginning at the early grade levels.

What is a French immersion class? It is one in which the teacher, usually a native speaker of French, teaches in French to children whose native language is not French. At the early grade levels, the basic pattern of French immersion is that all instruction is given in French until grade 2 or 3, when English Language Arts is introduced and taught in English. With each successive year thereafter a larger proportion of the curriculum is taught in English until an approximate balance is reached between the time devoted to instruction in each language.

The term 'immersion' has led to many a misconception of what actually occurs in a French immersion class. Although it is the case that in immersion classes French is the only language used by the teacher, it is *not* the case that it is the only language used by the children. During much of the first year in a primary-level French immersion program, the children continue to speak English among themselves and to their teacher. It is not until the second year of the program that the teacher begins to insist that the pupils attempt to express their ideas in French and, through gradual transition, French comes to be established as the language of the classroom.

Why has the demand for bilingual education focused on primary French immersion classes? One reason certainly relates to the assumption that only through immersion can a high level of French proficiency be attained. The recent Report of the Ministerial Committee on the Teaching of French (Ontario Ministry of Education, October 1974) has made this assumption more explicit by stating the various objectives thought to be attainable through different patterns of French



Students in French Immersion Classes at Allenby Public School

instruction. 'Top level' objectives include (1) 'The student can accept training or employment in the other language, or live in the other language community, after a short period of induction training'; and (2) the student 'can take further education in French in a bilingual educational institution . . .' (p. 22). The Report suggests that top-level objectives are attainable only through immersion programs.

Experimental Programs and Results

Another reason for the demand for primary French immersion classes has been the reports of the success of one such program initiated in 1965 in St. Lambert, a suburb of Montreal. The results of this program — a summary of which is given below — encouraged others to try the immersion model. For example, several boards of education in Ottawa initiated French immersion programs in the late 1960s and early 1970s. These programs have also been evaluated, and the results corroborate the positive findings of the St. Lambert experiment. The model of early

immersion, then, having been demonstrated to be a workable and effective program, was in operation last year in schools in nine of Canada's ten provinces.

Other models of bilingual education may prove to achieve similar results. Many experimental programs for the teaching of French were implemented in Ottawa in 1973 with the help of an exceptional grant from the federal Department of the Secretary of State. These experimental programs include a bilingual high school, immersion classes at the grade 6 level, partial immersion classes at the grades 7 and 8 levels, and single subjects taught through the medium of French at a variety of grade levels, as well as enriched and extended daily classes of French as a second language. Several research teams have been contracted by the Ontario Ministry of Education to evaluate these experimental programs, and the findings should provide some indication of their relative effectiveness.

In the meantime the results of studies evaluating the primary French immersion

programs continue to be positive. Each team of researchers — Edwards and Casserly at the University of Ottawa, Lambert and Tucker at McGill University, Swain and Barik at OISE — have examined at least four basic questions:

1. Are the children who are enrolled in the French immersion program more proficient in French than they would be if they received daily periods of instruction in French as a second language?
2. Does prolonged exposure to a second language result in some loss of facility in the students' native language?
3. Does instruction in a second language in, for example, mathematics affect the students' achievement in that subject?
4. Does the learning of a second language affect the child's IQ and general cognitive development?

Answers to these questions have been sought by administering tests of French language skills, English language skills, subject-area knowledge, and IQ to the students in the French immersion program and comparing their results with those of students with similar background characteristics enrolled in a regular English program.

Generally speaking, the results show:

1. French immersion programs lead to the development of French skills far superior to those of students following a course of French as a second language.
2. Prior to the introduction of formal training in English Language Arts, students in the primary French immersion program do not perform as well as their English-taught peers in English reading skills. However, they quickly catch up to their peers if they are introduced to formal instruction in English Language Arts at the grade 2, 3, or 4 level.
3. Where achievement in subject areas taught in French has been tested in English, students perform as well as their English-taught peers.
4. Students who have attended several years of a primary French immersion program do not show signs of cognitive retardation. They continue to perform as well on standardized IQ tests as their English-taught peers.

The St. Lambert Program

The French immersion program that has been evaluated over the longest time is the one in St. Lambert. For this reason, it is worthwhile to look in more detail at the results obtained from the evaluation of the grade 6 students who have been in the experimental program since it began (Bruck, Lambert, and Tucker, in press). The evaluation covered seven separate domains: English Language Arts, French Language Arts, French and English speaking skills, French phonology, achievement in content subjects, intelligence, and attitudes toward French Canadians, English Canadians, European French, and self.

In English Language Arts (as measured

by the Metropolitan Achievement Tests and the Peabody Vocabulary Test), the students in the bilingual class performed as well as their peers who had been taught in English.

In French Language Arts, the bilingual students were compared with native French-speaking students. They were somewhat behind in vocabulary knowledge; they wrote compositions in French that, although they contained no more grammatical errors, were less rich in content; and they scored at approximately the 60th percentile on a test of French achievement that had been standardized on a group of native French-speaking grade 6 students.

When asked to tell in English about a film they had been shown, the bilingual students performed similarly to their English-taught peers on all measures, including the number of episodes, details, and inferences recounted, as well as the number of false starts, grammatical self-corrections, and content self-corrections made. When asked to tell in French about the film, the bilingual students made more grammatical and content self-corrections than native French-speaking students, but otherwise performed similarly.

A number of phonological traits not characteristic of native French speakers were noted in the speech of many of the bilingual children. They included the diphthongization of the mid-vowels, the aspiration of voiceless stops, and inappropriate placing of stress on the first syllable.

The bilingual and the English-taught students were given standardized tests (in English) in mathematics, science, and social studies. The results obtained from the two groups were similar, suggesting that the progress of the bilingual children in subject content had not been impeded by participation in the experimental program.

On the Raven Progressive Matrices Test and the nonverbal battery of the Lorge Thorndike Test, the performance of the bilingual and the English-taught students was equivalent. These results suggest that the bilingual students have not suffered in their intellectual development as a result of receiving a major portion of their education via a second language.

The attitude profiles of the bilingual and the English-taught students toward French Canadians, English Canadians, European French, and self were essentially similar and positive, indicating an open and friendly attitude. By contrast, the French Canadian students tended to rate themselves and their own ethnic group higher than they rated English Canadians or European French.

The Ottawa Program

In addition to investigating the academic achievement, language skills, and general cognitive development of students in the immersion and regular classes, Edwards and Casserly also obtained measures of

behavior considered to be closely associated with dyslexia or learning disabilities (Pupil Rating Scale) and social maturity (Vineland Social Maturity Scale), together with measures on thirteen personality traits (Early School Personality Questionnaire).

Results obtained from the Pupil Rating Scale suggested that exposure during the first years of elementary school to a French immersion program did not result in a measurable increase in the incidence of learning disabilities. A number of personality differences between the groups were observed, such as the tendency of the immersion group to be more assertive and independent and less sociable. Edwards and Casserly (1973) suggest that these differences are probably 'due less to the program than to preselection factors affecting the parents' choice of a second language option for their children' (p. 58). Ratings of social maturity at the grade 2 level yielded significant differences in favor of the immersion group.

Other Studies

There are two other important studies that relate to the early-immersion model of bilingual education and are of considerable importance. The first is a study of the effects of French immersion programs on children with language disabilities. The second is a study on the suitability of French immersion classes for working-class children. We will look at each in turn.

A great deal of concern has been expressed about the feasibility of permitting children with language disabilities to enter a French immersion program. Bruck, Rabinovitch, and Oates (1975) reported on a study they have begun of English-speaking children with diagnosed language difficulties who are enrolled in primary French immersion classes. They are comparing the progress of these children with children who also have diagnosed language difficulties and who are enrolled in the regular English program; with children who are normal in their language development and are enrolled in the French immersion program; and with children who are normal in their language development and are enrolled in the regular English program. The children were identified as having language-learning disabilities according to their performance on a screening test battery, which consisted of an object manipulation test, a story retelling test, a sentence imitation test, and an echolalia test.

Progress is being assessed in native language development, cognitive development, school achievement, and second-language skills. Because the results are based on a small number of students they must be viewed as preliminary and tentative in nature. However, the general trend is worth noting: the children with language learning disabilities enrolled in a French immersion class do not fall behind their counterparts enrolled in the English pro-

gram—where they do not score as high as their counterparts in the English program, neither do the children with normal language development in the French immersion program.

The studies we have considered so far have dealt mainly with children from middle-class families. Little is known, however, about the effectiveness of French immersion classes for children from lower socioeconomic levels. Accordingly, Bruck, Tucker, and Jakimik (1973) administered a battery of tests to working-class immersion grade 1 and 2 students in Montreal and to comparable working-class groups of native English-speaking students and native French-speaking students. The tests were designed to measure native-language and second-language development, achievement in mathematics, and overall cognitive development. The investigators concluded that the pattern of results with respect to English language skills conforms with that found for middle-class groups in the St. Lambert study; that the experimental working-class groups are able to use their native language as effectively for oral communication as are their comparison groups; that they are acquiring a sound passive knowledge of French in terms of vocabulary, reading, grammar, and comprehension (although they are not at par with native French-speaking children); that they learn mathematics as well through French as their English-taught comparison groups; and that they are not being cognitively harmed by their participation in this program. In summary they suggest 'that this educational program is as appropriate for working class children as it has been found to be for middle class children, and that it is providing the children with the French language skills so necessary for education and occupational success in Quebec at no apparent cost to their general cognitive and linguistic development' (pp. 42-43).

IQ and Immersion Programs

Concern about the applicability of an immersion program for children from working-class backgrounds is to some extent based on the fact that working-class children tend to have lower *measured* IQs than middle-class children. But does measured IQ influence success in an immersion program to a greater extent than it does in a regular English program? The results discussed above suggest it does not. But this question can be investigated more directly by examining the relationship between measured IQ and various achievement scores obtained by children in a French immersion program, and comparing the results with the relationship between measured IQ and achievement scores obtained by children in a regular English program.

If IQ is more important to success in school in an immersion program than it is in a regular English program, one would

expect to find that student IQ would be more highly related to performance on standardized achievement tests in the immersion program than it is in the regular program.

Data were collected by OISE's Bilingual Education Project staff. Correlations were calculated between IQ (as measured by the Otis-Lennon Mental Ability Test) and each of the achievement scores available from pupils at the kindergarten, grade 1, and grade 2 levels of the French immersion programs in Toronto and Ottawa, and from their comparison groups in the regular English program. The achievement measures included the Metropolitan Readiness Test and the Stanford Early School Achievement Test at the kindergarten level; the word knowledge, word discrimination, reading, and math sections of the Metropolitan Achievement Test at the grade 1 level; and the word knowledge, word discrimination, reading, spelling, and math sections of the Metropolitan Achievement Test at the grade 2 level.

Generally speaking the correlations between IQ and achievement scores were no higher among the immersion pupils than among the pupils in the regular English program. Furthermore, for both groups, measures of numerical and mathematical skills tended to correlate most highly with measured IQ (in the range of .55 to .70).

These findings suggest that measured IQ is no more important to success in the French immersion program than it is to success in the regular English program.

Correlations were also calculated between IQ and each French proficiency measure obtained from the French immersion students at the kindergarten, grade 1, and grade 2 levels. The French measures included the Kindergarten and Grade 1 versions of the French Comprehension Test and the Grade 1 and 2 levels of the Test de Rendement en Français.

The French Comprehension Test (FCT) is a test developed by the Bilingual Education Project, and was designed primarily with French immersion students in mind. It measures the child's ability to understand French vocabulary, phrases, questions, and short stories presented orally. The Test de Rendement en Français has been developed by the Commission des Ecoles Catholiques de Montréal and standardized on children in Montreal whose native language is French. The test includes items involving identification of French sounds, word definitions, vocabulary, synonyms and antonyms, spelling, and sentence comprehension.

The results can be summarized as follows. The correlations between IQ and French comprehension were generally lower than the correlations between IQ and any of the standardized achievement measures mentioned above. Furthermore, they were generally lower than the correlations between IQ and the Test de Rendement en Français.

It can be concluded, then, that the correlational analyses of the IQ and achievement data do not support the notion that IQ plays a more significant role in the immersion program than in the regular English program as far as success in school is concerned. Furthermore, learning to understand a second language is, of all the skills measured, the least dependent on IQ.

Overall, the results to date concerning French immersion at the early grade levels suggest that French immersion is an educationally justifiable alternative to the regular English program in settings where bilingualism—for whatever reasons—is considered an asset by the community.

Note: I wish to thank Dr. H. C. Barik and Ms. Barbara Burnaby for reading and commenting on an earlier draft of this article.

References

- Barik, H. C., & Swain, M. 'Three-Year Evaluation of a Large Scale Early Grade French Immersion Program: The Ottawa Study.' *Language Learning*, in press.
- Bruck, M., Lambert, W. E., & Tucker, G. R. 'Cognitive and Attitudinal Consequences of Bilingual Schooling: The St. Lambert Project through Grade Six.' *International Journal of Psycholinguistic Research*, in press.
- Bruck, M., Rabinovitch, M. S., & Oates, M. 'The Effects of French Immersion Programs on Children with Language Disabilities—A Preliminary Report.' *Working Papers on Bilingualism*, 1975, 5, 47-84.
- Bruck, M., Tucker, G. R., & Jakimik, J. 'Are French Immersion Programs Suitable for Working Class Children? A Follow-up Investigation.' McGill University, 1973 (mimeo).
- Edwards, H. P., & Casserly, M. C. 'Evaluation of Second Language Programs in the English Schools: Annual Report 1972-73.' Ottawa Roman Catholic Separate School Board, 1973.
- Lambert, W. E., & Tucker, G. R. *Bilingual Education of Children*. Rowley, Mass.: Newbury House Publishers, 1972.
- Ministry of Education of the Province of Ontario. 'Report of the Ministerial Committee on the Teaching of French.' October 1974.
- Stern, H. H., & Swain, M. 'Notes on Language Learning in Bilingual Kindergarten Classes.' In G. Rondeau (ed.), *Some Aspects of Canadian Applied Linguistics*. Montreal: Centre Educatif et Culturel, 1973.
- Swain, M., & Barik, H. C. 'French Immersion Classes: A Promising Route to Bilingualism.' *Orbit*, 1973, 4(1), 1-3.
- Tucker, G. R., Lambert, W. E., and d'Anglejan, A. 'French Immersion Programs: A Pilot Investigation.' *Language Sciences*, 1973, 25, 19-26.

Why should I send my kids to OCA?

John Grube
Chairman of the Curriculum Committee
Ontario College of Art





Photographs courtesy Ontario College of Art

In early 1972 Aba Bayefsky and I took a group of OCA students out to the McMichael collection of Group of Seven paintings at Kleinburg. A. Y. Jackson accorded us an audience and was ushered in by his nurse. He and Aba chatted for a while, we all shook hands, and then it suddenly dawned on the old boy that we were from the Ontario College of Art. A strange expression passed over his face, half of anger, half of pleasure.

'You . . . are . . . from . . . OCA?'

'Yes.'

Pregnant pause.

'How . . . is . . . the . . . old . . . place?'

'Oh, very much the same, thank you.'

The Ancients versus the Moderns. Warring factions. Creative tension, all that sort of thing.'

'Who's . . . winning?'

'Hard to say. Both, probably.'

Survival at OCA requires tact, and I wasn't about to show my cards. But Jackson persisted. He had to know the details, and then he mentioned a story of half a century ago in which some of the Group of Seven painters had been involved in a battle royal at the college. His face lit up and his telling of the story revealed the intensity with which everyone remembers his or her own connection with the Ontario College of Art.

This intensity is the key to understanding the place. It is the intensity of involvement, the intensity of a total educational experience. The main building itself is deceptive, in style something between a 1930s Normal School and a 1950s bank, and it is located in a shabby but on-the-way-up section of the Toronto downtown core. So, let's start by taking a look at the Annex, the home of the Experimental Art department. Half a block down the street, the Annex is fondly known to the students who do their art there as the Brink's Building or even the Chinese Noodle Factory, since it has been both in its time. It is really still a warehouse with a concrete floor, ideal for the large, bold sculptures the department encourages, and only a small part of it has been made into offices. There is a friendly, relaxed atmosphere in the big room, an improvisational quality, and students are working in groups or on their own here and there. This is the home of conceptual art, and large hunks of wood, steel, and other

unorthodox materials dot the landscape. In one corner Nobby Kubota, the architect turned sculptor, may be explaining to students why he chose to build a certain type of abstract sculpture for a certain government building in Ottawa, while in another corner Graham Coughtry is probably trying in his shy and painful way to help an aspiring painter understand his craft.

Down at the end of the building is a section marked VIDEO. Is this where they teach students how to make TV commercials, as the word would suggest? Is this where they train technicians for the television industry, a rival to Ryerson's famed Radio & Television department a few blocks away? Not in the least.

Although Video is part of the Technological Studies department, its spirit is with Experimental Art and that's why it is at home in the Chinese Noodle Factory. Video is a new medium, Michael Page will tell you, and so will his student monitor Brad Townsend. Video art must be seen as art, just as an etching or an oil painting is. Right or wrong, the view is passionately held, and Michael and Brad might well offer to explain it to you over a few beers in the Beverley Tavern around the corner. You don't have to be famous to teach at OCA — in fact, the college has never had a policy of building on imported stars as some of Ontario's instant universities have done — but you have to believe in your kind of art and defend it against all comers. That's what Michael and Brad do — with or without a few beers. On the way out of the Annex building you might have to step around Gus Weisman and his drawing students, who will be doing sketches of a model in motion rather than posed, or the students of color-field painter Dan Solomon learning the mysteries of abstract composition.

Across the street are four quaint Victorian houses the college bought some years ago and one of them, 76 McCaul, is used as a gallery of student art. There is a new show every two weeks during the entire year, and this often helps the young artist get his first public reviews — good or bad — and even sell his paintings. With the refurbishing of the Art Gallery of Ontario, many well-known dealers have moved to the Dundas-McCaul area and an increasing number of aware collectors

are including 'Gallery 76' on their Saturday afternoon gallery tours.

The next house is the home of the Liberal Arts department, which gives courses of university credit standing in such fields as history, philosophy, the social sciences, art history, and English to students in the entire college. It provides the intellectual and academic side of the student's four-year education to balance the heavy emphasis on studio work, which is quite rightly the core of the programs offered by the various art and design departments — in fact, the quality of OCA's studio work with students is giving it the reputation of 'the last place left in North America where you can still learn to draw'. But the input of Liberal Arts into the student's creative growth has its own unique flavor that makes it quite different from the academic course offered to art students in community colleges or universities. Take John MacGregor, an art historian who has also studied psychiatry. He offers a course cycle dealing with the art of children, of the insane, of primitive tribes, that opens up to the student an unusual range of new visual possibilities. Or Eli Rill, who was on the board of Actors' Studio in New York for many years along with Elia Kazan and Lee Strasberg. He runs popular theater arts classes that not only teach acting but make the student aware of three-dimensional space and its use, a grasp of which is invaluable to the interior designer or the sculptor. In other words, the art student at a university or community college goes to the English department to take an English course given by a professor of English — who may or may not have an interest in art — while at OCA he will take that course from someone who is aware his course must fit in with the student's art and design goals, must be part of OCA's total educational experience. The fact is that students often ask Liberal Arts staff to take part in critiques of their work.

In a college whose enrollment is deliberately kept down to a thousand, staff and students cannot help — for better or for worse — getting to know each other personally. This interaction takes place all the time. As I was walking into the main building the other day, environmental design student Bryan Boigon buttonholed me.

'John, gotta minute?'

'No. I'm busy as hell.'

'Oh, come on. I want to show you my project.'

'I don't know anything about design, Bryan. Really.' Half an hour later the two of us were still at Bryan's work-station, poring over his design for a youth hostel in the Rosedale ravine. There wasn't a slide-rule in sight and the walls were plastered with collages and freehand wash-drawings. I couldn't see how they fitted into the project.

'I like the wash-drawings of you in an Amsterdam park, or you diving into a

Florida swimming pool, but what have they got to do with a youth hostel?'

'Images.'

'What?'

'Images.' One gets used to different vocabularies. I waited.

'Images, John. Get it?'

'No. Explain from the beginning.'

'Well . . . Elin Corneil, she's an architect who teaches here part-time and . . .'

'I know.'

'Well, she told us to think of places we'd had fun in, had liked, and then to do freehand sketches or collect photographs of them.'

'Why?'

'Because youth hostels have to be places where young people want to be, where they feel at home, where the vibes are right. If I think back to all the places I've had a good time in, and think out why the place was right for it, then I'll begin to understand what features a good youth hostel will have. It won't be just a copy of some other youth hostel. You have to think first and draw up the formal plans much later in the process.'

It seemed like a good approach and Bryan was heavily into it with all the energy and enthusiasm of youth. My eye wandered to a 3" model of a hammock on the next work-station. I picked it up.

'What's this?'

'A portable hammock.'

'A portable hammock?'

'Yes. Most hammocks are made and sold to be hooked up from one tree to another. But suppose you want to swing in a hammock and there are no trees around?'

'Then you can't.'

'Yes you can. You set up a couple of poles at either end and sling the hammock from them. When you're through, you pack it up like a pup tent.'

'Wow! Is there one on the market yet?'

'I don't think so.'

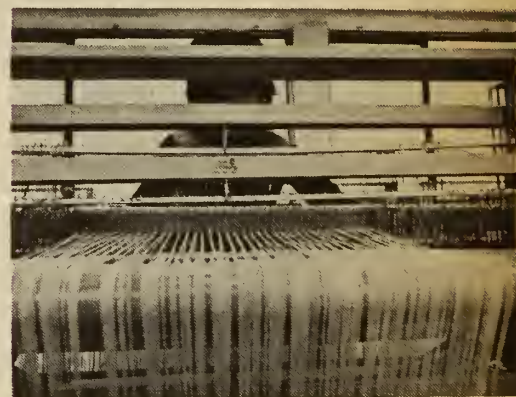
'It's a million-dollar idea. All it needs is a trial production run and some promotion.'



Environmental design can shade off into industrial design, and OCA has a department that can show students how to take industrial design ideas like this one through to completion. It is headed by Charlie Wetmore, a man with years of experience behind him in the hard, cruel world of business. One of the most

remarkable features of OCA is the number of instructors who have made it in the business world but choose to spend part of their time teaching at the college. It means that theories by themselves are not enough. They have to be tested in the real world, and this is something students come to appreciate.

Helen Frances Gregor, head of Textiles, is well aware of this. While some of her own finest tapestries hang in private collections and public buildings such as Hamilton Place, many of her graduates are busy designing textiles in leading companies. Weaving is a craft, and is honored as such at OCA, but it can also be art and almost always involves design. The same is true of Ceramics, headed by Don Wallace. You can learn to throw pots, you can make large terra cotta statues, or you can go into the industrial applications of the field. Both sections are of course open to students in all years and in all areas of the college.



The same is true in a sense of the department of Technological Studies, which is headed by a cheerful Englishman called Mike Harmes. Himself an expert in wood design and technology, he also keeps an eye as best he can on the various shop activities such as metal welding, plastics, and the foundry. Again students from design and fine art use these facilities equally, and in fact there is almost no art medium known that is not to be found tucked away here or there in the building. Mike's shops are in the basement — perhaps because they are the foundation upon which so much good art is made.

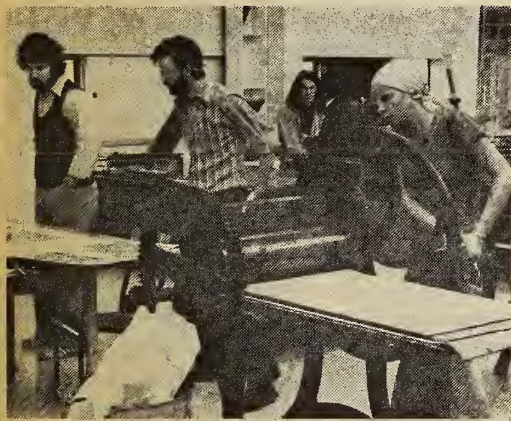
If you bump into a handsome but harried man turning a corner, he is very likely David Hall-Humpherson, the chairman of Foundation Studies. Foundation Studies, or first year, offer incoming OCA students a balanced mix that lets them choose their path wisely in the upper years. Half of the courses are mandatory and the other half free options. Why are some courses mandatory? Well, in first year every student has to take a course in drawing, for the very simple reason that drawing is vital to every area of fine art or design just as calculus is fundamental to all engineers. OCA has discovered that throwing a pot of paint at a canvas just isn't enough, even for the artist who ends up doing the most avant-garde work. And drawing is drawing,

whether the student in the end goes into environmental design or high realism.

Design is also mandatory in the first year because the principles of design are the same for a student working out an attractive youth hostel as they are for the student painting an 8' x 12' canvas. Both must learn to be sensitive to color, shape, form, texture, and spatial configurations. But half of the first-year student's courses are optional, and this means that he can take any course offered in the college in second, third, or fourth year if the class is not already jammed and if the student is technically up to it.

This rather unusual openness is due to the desire of the college to give the student as much freedom as is possible while still maintaining a certain minimum structure. It also recognizes the individualistic and independent nature of the art student and the fact that many a student has entered determined to be a sculptor and discovered that his real love is the typography and graphic design of the Communications department — or vice versa. It is always a mistake to let students enter a specialized department until they have been exposed to a wide variety of choices and have had ample opportunity to make up their own minds.

That is one of the reasons why many people at the college insist there is a valid place for the art student who never specializes, the generalist student, the student who might spend a great deal of time in Ted Soame's photography section one year only to devote himself with equal enthusiasm the next to print-making with Fred Hagan or Marlene Honsa. Few students burn with a hard gemlike flame in one medium only for four years.



You can't miss the Communication and Design department on the second floor: the doors are fire-engine red. The chairman, Bob Mitchell, was an art director with a leading Canadian advertising company before coming to OCA, but the student will not simply learn here how to do a layout or the other technical aspects of advertising design; he will learn that the advertisement itself is a moment only in the total marketing cycle, that corporate design, understanding the 'soul' of a company and how it can be projected in visual symbols, is just as important as

learning which type faces are available and how to use them. The department of Communication and Perception, headed by Richard Hill, pulls together the intellectual aspects of communication theory.

There is often a certain snobbery in regard to what the OCA Act calls 'applied arts.' Are they art? What is art? Bob Mitchell vigorously defends against all comers the rights of the applied arts he teaches and supervises to their place in the OCA sun, but students should know in advance that sometime during their career they will have to argue, debate, and settle for themselves the question 'What is art?' because such questions are taken very seriously at the college. Personally, I like the fact that half the conversations in the cafeteria at any given moment are about such problems, and I regard it as a sign of institutional vitality, even when our squabbles sometimes hit the headlines of the Toronto papers.

Tucked away discreetly on the third floor is the Fine Art department. One of its leading lights is Eric Freifeld, perhaps Canada's best-known realist painter. Eric is a man of deep culture and wit who has kept the tradition of realist painting alive at OCA in the teeth of all the style changes that emanate from New York and sweep over the North American art scene every couple of years — pop art, op art, minimal, conceptual, and the rest. Mind you, his view of fine art allows for all varieties but insists on mutual respect between painters of various schools; and this department in fact includes painters such as François Thépôt, who does color studies as good as Vasarely's but without the 'flash,' and John Inglis, who recently held a successful exhibition of rather mystical abstract sculpture at the art gallery of Erindale College. The department tries to avoid the dominance of any particular passing fashion. I was talking about this with hard-core-realist instructor John Newman recently, and he is one of the staff members who have insisted that the first year must include a drawing course.

'People like Eric and myself are the Roman Catholics of the art field.'

'I don't understand. Catholics?'

'Yes. We know what we believe. We can spell it out.'

'Well, if you realists are the Roman Catholics, what does that make all those guys down in the Annex, all the artists floating around the college who aren't realists?'

'They're the Unitarians of the field. You know the Unitarian position . . . all religions have some merit, they're all more or less the same. It's too vague to satisfy us.'

'I see. I hope they aren't going to be condemned as heretics?'

'Good God, no! The Inquisition was abolished years ago. In fact those of us upholding the true realist faith are very much in the minority these days.'

Canadian citizens may not be attending mass as regularly as they used to, but

Canadian art students are crowding into the Fine Art drawing and painting studios at OCA to the point where they have to be careful not to jog each other's elbows and ruin a neighbor's drawing halfway through a six-hour pose. Life-drawing from a posed model is very popular today, much more so than it was ten years ago or even twenty years ago, and people like Eric are very happy about it — unless it turns out to be another passing fashion!

While the principle underlying the college's curriculum is to have the maximum freedom within the minimum structure, the successful application of this principle is only possible because we have the continent's first unicameral system of government. The governing council is empowered to make all decisions, be they financial or academic, and has the manageable number of nineteen. Nine are appointed to represent the public interest by the government (this way the expertise of a judge, a lawyer, an architect, an art historian, and a management consultant are available to us at the moment for nothing!), six members are elected by and from the full-time academic staff, and there are three student members. What this really means is that no major decision can be made unless there is pretty good agreement about it from all three 'estates.' The council committees too are careful to have elected student representatives, and very often their input is an invaluable element in the final decision reached — say, about the curriculum structure. Slow and painful as democratic structures can be, particularly in drawn-out committee meetings, I regard this student participation in government as one of the best 'courses' we have to offer the student, one that does not hand out the paper platitudes of political science but the daily realities of give and take that keep our 'real' governments stumbling forward somehow or other in Ottawa or Queen's Park.

Why should you send your kids to OCA? Primarily because it will offer them the most intense experience of their educational life, but one tempered by plenty of hard thought and hard work and a beer every now and again down at the Bev. But why not come to our annual show of student work in April and see it all for yourself?



In Ontario, the art of educational research is beginning to show progress, and while there are still many instances when researchers do not have the answers to important questions, they are better able to indicate directions in which more effective educational practice might go.

Communication between researchers and practitioners is also improving. There is more opportunity for them to rub shoulders with each other as school systems establish their own research departments, faculty of education personnel cooperate in studies with school system people, OISE staff members extend their activities, and the Ministry (through grants-in-aid and contract arrangements) provides more funding for examination of questions generated by changes in schools. Many of these research activities include a development component, which translates the findings of the research phase into practical materials or activities.

This article describes the use of research techniques to survey various aspects of a school's semester system, together with the subsequent organization of professional development activities based on the research findings.

The Project

The research project was carried out in an Ontario secondary school that switched from a traditional to a full-credit semester system in September 1973. The semestered timetable maintained courses and course content similar to previous years but arranged the day into four seventy-five-minute periods with a five-minute locker break between classes and an extended lunch period to allow for extra-curricular activities. Each semester was five months long, with the midyear change in late January.

In the fall of 1973 the principal and staff agreed that it would be desirable to monitor various aspects of the school's operation under the new system. The purpose of this monitoring was not to compare a semestered with a non-semestered system but rather to obtain a picture of the current school operation so that any necessary changes could be introduced.

The study focused mainly on the achievement of learning objectives, methodology, homework, school and classroom atmosphere, human relationships, extracurricular activities, and community relations. A steering committee, which included the principal and representative teachers, students, and parents, was established, and this committee requested personnel from the OISE Midwestern Centre in Kitchener to assist with the project.

The project was divided into four major

In-School Research and Professional Development Programs

David J. Ducharme and John A. Ross
OISE Midwestern Centre

stages. Design of the study and development of survey instruments (Stage 1) were carried out by a subgroup of the larger committee that included school staff and Midwestern Centre personnel, and their work was subject to the approval of the larger committee.

Data collection and preliminary analysis (Stage 2) were the responsibility of school personnel. Questionnaires were distributed in the second semester to the student body, to the teaching staff, and to a random sample of parents. In addition, students in Man in Society classes conducted structured interviews with storekeepers in the village where the school is located and with residents living near the school. When the survey activities were completed, frequency counts on the questionnaire data were compiled within the school.

Further analysis and interpretation of the information (Stage 3) were the responsibility of OISE Midwestern Centre staff. The final summary report (Stage 4) was drafted by school staff members and approved by the larger committee prior to wider dissemination to the staff, students, community, and school board.

Findings

1. More than 70% of the teachers indicated that they were achieving most of their course objectives under the new system.
2. Students and teachers agreed that the socratic method of teaching the whole class remained the staple of the pedagogical diet. Variations of this method included the assignment of specific tasks to small student groups, teacher demonstrations, lectures, individual classwork, and the like. Occasionally seminars were

held, individuals were allowed to work out of class, kits were introduced, outside speakers were brought in, and field trips were arranged. Approximately half of the students and three-quarters of the teachers reported an increase in the variety of teaching methods used in the new situation. The remainder indicated no change — except for a small percentage of students who reported a decrease in the variety of methods. All teachers saw themselves as successful in maintaining student attention, although four-fifths categorized themselves as being 'moderately' successful rather than 'very' successful. Two-thirds of the students agreed that it was easy for them to maintain attention, but the other one-third reported some degree of difficulty in doing so. The ease with which students were able to maintain attention varied among subject areas.

3. There was general agreement between students and teachers with regard to the amount of homework that should be done per course; but whereas teachers might expect students to do up to thirty minutes a night, students felt that fifteen minutes was more reasonable. The amount also varied according to subject area and grade level.

4. Approximately 70% of the students and 85% of the teachers felt the school atmosphere to be relaxed; about 80% of the students and all of the teachers reported that their classrooms were relaxed. Again, the degree to which students thought classrooms were relaxed varied among subject areas.

5. Roughly two-thirds of the teachers and one-third of the students felt that longer periods improved staff-student relationships and relationships between individual

students and individual teachers. About 40% of the teachers and more than half of the students felt that longer periods improved relationships among students. No teachers and only a small minority of students reported that the longer period had any negative effect on human relationships in the school. No teachers reported that the long lunch hour had a negative effect on relationships among people in the school, although about one in eight of the students did so. Teachers tended to see the main benefit of the long lunch hour in terms of relationships among individual teachers and individual students, whereas students tended to see the main benefit in terms of relationships among students. 6. About half of the students indicated that the extracurricular activities in the noon hour were sufficient. About one-quarter regarded the noon hour program as inadequate and the remainder expressed no opinion.

7. The majority of local residents were unaffected by the semester system and appeared to be unaware that the school had changed its organization. Similarly the effect of semestering on the adjacent business community was negligible.

In keeping with the purpose of the project the findings were examined for activities that could increase the effectiveness of the school's operation under the semestered organization. Each finding was considered somewhat tentative because the data were collected in the first year of operation under the new system. However, two of the findings clearly indicated a need for responsive action.

The first of these was the somewhat limited range of methodological techniques used by the teachers in the longer classroom period. The possibility that the socratic method was being overextended was considered — especially in view of the large majority of teachers reporting that they were only 'moderately' successful in maintaining attention.

The second was the variation in study results across some subject areas with respect to attention, homework, and classroom atmosphere. It was felt that these results required examination of each subject to ascertain the reasons and the action needed.

Professional Development Activity

The first professional development activity to consider change based on the project findings occurred prior to the beginning of the 1974/75 school year. The program was conducted with the school staff by OISE Midwest Centre personnel, and sought to provide an opportunity for an individual assessment of teaching practice by staff members, for a sharing of methodological expertise across subject areas, and for an

examination of the reasons underlying specific results within subject areas.

The program began with an individual review of teaching methods. Each staff member was given a list of relatively common teaching techniques and approaches and asked to rate himself according to frequency of use, personal potential for use, probable use in the near future, and probable use given additional training. Teachers were also asked to check the techniques and approaches that they thought could be used more easily in the longer periods. The list included lecture, student presentation, socratic method, teacher demonstration, student demonstration, audiovisual presentation, individual student work in class and out of class, individual instruction, small-group work, out-of-school learning activities, bringing in outside resource persons, programmed materials, kits, simulation exercises, role-playing, games, structured discussion, and other.

This individual activity provided each staff member with insight into the current state of his professional practice, of his professional potential, and of his training needs for this potential to be realized. It also gave him an information base to carry into the group activity.

Having generated these personal data, staff members formed into groups that included a cross-section of people from different subject areas. In these groups each teacher in turn described one technique he had found effective in the longer period. These descriptions continued around the group and were recorded until no more new ideas were forthcoming. Each technique suggested was then discussed in terms of its applicability to the subject areas represented in the group. Finally, the group listed in-school resource persons who might be helpful if anyone wished to attempt an approach with which they were unfamiliar. All the information was recorded for sharing with the total staff.

This group activity was based on the assumption that a school staff as a whole has a considerable competence in a wide range of teaching techniques and approaches. It is the experience of many school staffs, however, that communication about and assistance with the use of these techniques does not often cross subject-area lines. What is necessary, then, in developing a basic degree of competence in hitherto untried approaches is an open attitude to new experience, a willingness to learn from others — particularly one's colleagues — and some means of sharing knowledge and working together to develop skills.

The above activity helps the individual take inventory of his own skills, helps him

assess techniques in terms of their use in his own subject area in the longer period, and introduces him to easily available resource persons to whom he can turn in expanding his own methodological repertoire. Follow-up professional development programs can focus on training in specific techniques such as simulation, role-playing, programmed learning, effective use of groups, and so forth. These can utilize in-school or out-of-school resource persons. If the latter are used, the former should attend the training sessions so that they are available for in-the-building assistance when new approaches are being tried.

For the final component of the professional development program the groups were restructured along subject-area lines. Within these groupings the teachers looked at specific study results on attention maintenance, homework, and classroom atmosphere. They brainstormed possible reasons for the results, the degree to which the results indicated a need for changes, and specific steps to be taken. Follow-up activity will focus on specific subject-area needs, but wherever possible is to be coordinated with those training activities that cut across subject lines.

Implications

The process that has been described seems to those involved to have important implications for the development of program innovations and related professional development activities. First, it demonstrates the benefits of researchers and practitioners working cooperatively *on site*. Second, it shows how research activities can be incorporated into the teaching/learning situation (as indicated by the involvement of Man in Society students in this project). Third, it suggests a potentially useful approach to the development of a schoolwide professional development program.

Professional development programs in secondary schools have typically been isolated events, carried out in the context of a subject orientation with a sometimes loosely defined relationship to the professional needs of the people involved. Through a research-oriented approach to identifying needs it is possible to create programs that are geared to school program requirements and within which subject-oriented activities can be incorporated. Needs that must be met can be pinpointed, and directions for intermediate and long-term development can be plotted. The challenge of establishing ongoing, relevant, and comprehensive professional development programs over the course of one, two, or three years can be met in a more effective manner.

Evaluation coopérative: Coup d'oeil rétrospectif

Eugène-R. Touchette
OISE Ottawa Valley Centre

Au début de l'année 1973, le Ministère de l'Éducation de l'Ontario invitait les conseils scolaires de la province à s'engager dans un projet pilote d'évaluation coopérative des systèmes scolaires. Ce projet avait été conçu par son Service de la supervision en réponse à une enquête menée par un sous-comité ministériel comprenant des représentants de l'OAEAO, de l'OSTC, de l'OTF et d'agents du Ministère. Des conseils répondants à l'invitation du Ministère, quatre furent retenus pour la première expérimentation: les écoles du Ministère de la défense nationale en Europe (4,000 élèves anglophones et 500 élèves francophones), le Conseil scolaire de West Parry Sound (3,000 élèves anglophones), le Conseil scolaire de Dryden (5,400 élèves anglophones) et le Conseil des écoles séparées d'Ottawa (12,000 élèves anglophones et 12,000 élèves francophones).

Le coup d'oeil rétrospectif de cette présentation se rattache au projet d'Ottawa, secteur francophone. Les diverses étapes du cycle de l'évaluation seront présentées et quelques suggestions en vue d'améliorer les projets à venir vous seront soumises.

Le cycle de l'évaluation coopérative comprend six étapes. Elles sont:

1. la demande officielle,
2. l'évaluation interne,
3. l'évaluation externe,
4. la révision coopérative,
5. le rapport final, et
6. les activités subséquentes.

La demande officielle

Le conseil scolaire devra passer une résolution déclarant qu'il s'engage à suivre cette méthode d'évaluation, faire parvenir cette résolution au Ministère et nommer un président pour le comité d'évaluation interne une fois que le Ministère a consenti à participer.

Au mois de mars, les conseillers assistent à une présentation du projet par les agents du Ministère lors du Congrès des conseillers scolaires. Ces mêmes agents rencontrent les administrateurs et les conseillers scolaires au cours des mois qui suivent afin d'éclairer ces derniers. Le 14 mai la résolution est passée au conseil et le 25 juin les coprésidents sont désignés (Mme Carole Barrett et moi-même).

Les agents du Ministère ont adopté une ligne de conduite prudente en essayant de ne pas créer trop d'attentes chez tous les intéressés. Ils ont demandé et obtenu carte blanche dans l'établissement de tous les mécanismes nécessaires à l'évaluation.

Dans l'élaboration d'un deuxième essai de cette méthode d'évaluation, il serait bon que les conseillers et les dirigeants scolaires connaissent davantage la teneur des sondages d'opinions afin qu'ils puissent se rendre compte de l'étendue possible de l'exercice et de l'aspect

subjectif des résultats. Il serait également préférable de projeter (et de passer?) le budget nécessaire à l'exécution de l'évaluation avant l'entente finale entre le conseil et le Ministère.

Le coordonnateur du projet

Son rôle est d'accepter la direction et la responsabilité du projet d'évaluation coopérative. Il a pour fonctions de rencontrer le conseil scolaire et le directeur régional, de participer à l'élaboration du modèle d'évaluation interne, de choisir et voir à la préparation de l'équipe externe, de recevoir les rapports internes et externes, d'organiser et de diriger la révision coopérative, de préparer le rapport officiel et d'aviser le conseil scolaire au besoin.

M. Berchmans Kipp du Service de la supervision accepta de coordonner le projet d'Ottawa et malgré ses nombreuses occupations s'acquitta de toutes ses fonctions.

Il serait peut-être avantageux que la personne du coordonnateur soit plus facilement accessible. Les distances qui le séparent du lieu de l'évaluation et les obligations dictées par son travail quotidien portent à croire qu'un coordonnateur de la régionale pourrait répondre au besoin de la présence plus fréquente de ce dernier.

Il serait également avantageux pour tous les intéressés si dès le début du projet le coordonnateur, les dirigeants du conseil et le président interne pouvaient établir l'étendu de l'évaluation en déterminant certaines priorités.

Le président du Comité interne

Son rôle est d'accepter la direction et la responsabilité de l'auto-évaluation du système scolaire.

Comme le président du Comité interne est la seule personne du conseil engagée à plein temps dans ce processus les termes de direction et de responsabilité englobent une multitude d'aspects non nécessairement identifiables avant un premier essai.

Pour les projets à venir, il serait convenable qu'il connaisse un peu plus l'ampleur de son travail.

Il doit être efficace en relation avec le public. Il doit s'assurer que tous les médias locaux, les journaux, la radio et la télévision soient bien renseignés et de façon continue. Il doit posséder une certaine connaissance des personnes à l'emploi du conseil afin d'établir les liens nécessaires. Il doit connaître les processus et techniques de l'évaluation. Enfin il doit connaître les limites de sa liberté d'action.

Le Comité interne

Ce comité sera responsable des principales étapes du processus d'évaluation, des techniques à utiliser pour rassembler les données, du contenu des rapports, de l'horaire à suivre, des méthodes à utiliser pour informer régulièrement le personnel

de tous les niveaux de ses plans et de ses travaux. Il participera aussi à la révision coopérative.

Toutes les personnes à l'emploi du conseil, pédagogues aussi bien que personnel de soutien, furent invités à soumettre leur nom en tant qu'intéressé à devenir membre actif du comité de direction ou des sous-comités d'étude. Cent deux personnes ont soumis leur nom; soixante-cinq ont été retenues pour dix sous-comités.

Une invitation de collaboration avait aussi été lancée aux parents lors des rencontres d'API.

La composition du comité de direction était la suivante: direction d'écoles (2), assistant à la direction (1), enseignants des niveaux primaire (1), moyen (1), intermédiaire (1), personnel des services pédagogiques (2), personnel administratif (2), parents (2).

Ces personnes assumaient la présidence des sous-comités.

Attendu que ces personnes ont donné en moyenne cent cinquante heures de travail bénévole et en grande partie en dehors des heures régulières il serait convenable que compensation soit faite.

Attendu que ces personnes n'avaient pas toutes les connaissances nécessaires à l'élaboration d'outils d'évaluation et à l'analyse des données recueillies, il devrait se tenir, au cours du processus, des ateliers qui initieraient ces personnes.

Ces comités ont adopté et adapté vingt des vingt-trois questionnaires soumis par le Ministère. Ils en ont formulé cinq autres dont un en collaboration avec le Centre de recherches de la faculté d'Education de l'Université d'Ottawa. Ils ont en plus formulé un questionnaire pour entrevue individuelle.

Chaque sous-comité a composé le rapport de ses diverses études, lequel s'intègre au rapport interne.

Des circonstances incontrôlables ont retardé la distribution des sondages à janvier, c'est dire que trop peu de temps fut disponible à l'analyse des données et surtout à l'étape de vérification prévue pour entrevues individuelles et de groupes. Il serait peut-être préférable de débiter le projet en mars, de distribuer les questionnaires en juin afin de permettre l'analyse pendant les mois d'été et d'entreprendre en septembre une vérification en règle. C'est dire que la durée totale du projet serait de quinze mois au lieu de dix tel que prévue.

Rapport du Comité interne

Le rapport du comité interne pivotait sur quatre questions.

1. Quelle est la nature de notre système scolaire?
2. (a) Qu'est-ce que les enseignants, les élèves et les parents attendent de notre système scolaire?
(b) Selon eux, dans quelle mesure le système répond-il à ces attentes?
3. A titre de conseillers scolaires, d'admi-

nistrateurs, et d'enseignants, quels sont nos points forts, nos faiblesses et quels sont nos projets d'avancement professionnel à longue et courte échéance?

4. Quels sont les points forts, les faiblesses et les projets de développement de chacun des programmes évalués?

Le rapport interne des francophones comprenait 201 pages, le rapport interne des anglophones en avait autant. Ce fut trop volumineux. Il faut se rappeler que ce rapport est destiné à l'équipe externe seulement pour vérification du contenu. Un modèle de présentation synthèse en fonction de son usage devrait être développer pour les projets à venir.

Un dialogue entre les membres des deux équipes interne et externe devrait avoir lieu avant la visite de cette dernière afin de clarifier les points qui demandent explications.

Enfin il serait de mise que l'équipe externe ait entre les mains, deux semaines à l'avance, le rapport interne afin de se familiariser et d'approfondir ce document, base de leur travail.

Le président de l'équipe externe

Son rôle est d'accepter la direction et la responsabilité de l'évaluation externe d'un système scolaire.

Le choix de ce président, M. Rosaire Léger, fut celui du Directeur général, du coordonnateur et des co-présidents.

De même que le rôle du président du comité interne se précisa par cette première expérience du projet, celui du président de l'équipe externe mérite une attention particulière qui malheureusement devrait être entreprise par ce dernier non par un agent extérieur.

Tout de même il semble évident que ce président puisse connaître l'ampleur du projet afin qu'il puisse accorder tout le temps voulu à se préparer, préparer son équipe, formuler son rapport, participer à la révision coopérative et au besoin contribuer à l'amorce des activités subséquentes.

L'équipe externe

Ses fonctions furent d'étudier le rapport du comité interne, de visiter les écoles et les locaux du conseil, de rencontrer les membres du personnel et quelques parents, de préparer le rapport externe et de participer à la révision coopérative.

Dix-neuf membres formèrent cette équipe et ils passèrent dix jours sur les lieux. Ils élaborèrent des formules de vérification et d'entrevues personnelles et de groupes. Ils s'acquittèrent de toutes les fonctions mentionnées au mandat. La plus grande difficulté qu'ils eurent à surmonter fut le trop peu de temps en possession du rapport interne.

Leur rapport devait être remis au comité interne en prévision de la révision coopérative. Il serait de mise qu'une formule de rédaction synthèse soit élaborée afin de faciliter l'échange.

La révision coopérative

La révision coopérative est présidée par le coordonnateur. C'est à la révision coopérative que doivent se clarifier les points obscurs des deux rapports. Suite à cette clarification les points d'accord ou de désaccord sont établis. Enfin des recommandations conjointes ou séparées sont définies.

Chaque équipe, pendant les deux jours de la révision eut l'occasion d'exprimer ses vues et de s'assurer que les messages perçus furent bien interprétés et inscrits.

Une étape de la révision pourrait être éliminée: la clarification du rapport interne. Cela suppose que cette étape précéderait la venue de l'équipe externe dans le système scolaire. L'argument qu'un tel procédé risque d'influencer l'équipe externe en faveur des résultats du comité interne serait compenser par une meilleure connaissance du milieu.

Le rapport final

Ce travail de rédaction est du ressort du coordonnateur. Ce dernier base sa rédaction sur les rapports interne et externe et sur les précisions apportées à la révision coopérative. Il peut inclure dans son rapport ses propres constatations.

Il serait peut-être bien de confier cette rédaction au coordonnateur en collaboration avec les présidents interne et externe.

Le rapport final étant un document de travail destiné aux conseillers scolaires il serait convenable qu'un document synthèse soit aussi rédigé, lequel document serait composé en vue d'être distribué à toutes les personnes qui ont contribué à l'évaluation coopérative.

La rédaction du rapport final pourrait dépasser le cadre des données recueillies en y ajoutant des suggestions d'approches à des solutions.

Activités subséquentes

Ici le champ d'action demeure à explorer de la part des conseils scolaires et du Ministère de l'Education. Tant d'énergie, de temps et d'argent ne peuvent être enfouis: cela signifierait la futilité de ce processus d'évaluation.

Advenant qu'un conseil scolaire est reconnu comme ayant un urgent besoin de personnes compétentes ou d'aide financière à la suite d'un tel projet il serait convenable que le Ministère assiste ce conseil soit financièrement soit en lui fournissant les personnes nécessaires. Un programme d'échange de personnel serait peut-être une solution possible.

Le gain immédiat de l'évaluation coopérative fut la prise de conscience de tous les participants de la qualité de l'éducation dans leur système scolaire. Chacun en est sorti plus convaincu que jamais qu'il y avait beaucoup de fait et qu'il restait encore beaucoup à faire.

Note: Ce-dessus a été présenté au Ontario Educational Research Council, le samedi 7 décembre, 1974.

Student Response to Some Problems Requiring the Use of Thinking

David Ireland
OISE Ottawa Valley Centre

I should like to present the results of some informal research conducted during the past year in various grades in two schools in the Ottawa region. The purpose of describing the studies is to illustrate a model of learning that I believe is being ignored by the current curriculum developers, to indicate a deficit in what students are currently learning, and to use the model to suggest alternatives in both teaching strategies and in objectives.

Of itself, the model is very simple. It is a three-part system for describing the cognitive outcomes of school. The first part is *knowledge* — that is to say, specific information that is available for recall in specific situations. Examples include names (of yourself, of historical figures, of chemicals), facts such as when, where, and why, and number facts such as the multiplication tables. Given the right stimulus, the emission of these responses can be predicted with considerable probability.

The second part is *algorithmic*. For those who do not know, an algorithm (apart from being the corruption of the name of a Spanish Moor who was famous as a mathematician) is a set routine for finding the solution to a particular kind of problem, if indeed there is a solution. Mathematics and the sciences provide some of the best examples of such set procedures. For example, we have all at some time or another learned to calculate the product of two numbers each in the hundreds or more — multiply everything in the top line by the units in the bottom line, then by the tens, and so on.

The third part is *thinking*. Very generally, I define thinking as that set of skills (and the strategies required to deploy them appropriately) that are brought into play when neither of the other two parts of the model readily suggests an adequate response. Such situations can occur for several reasons. They may, for instance, be entirely novel so that there exists as

yet no suitable response or algorithm. Or it may be that because of the complexity or ambiguity of the situation, conflicting responses seem equally appropriate. A special case of the latter is where the situation is insufficiently defined so that, given the data available, several responses or algorithms are equally appropriate.

The studies we conducted last year were directed toward investigating how students behaved when presented with problems for which they did not have ready-learned responses or for which algorithms were not available to them. The investigations were part of a program we are carrying out to develop materials in one form or another that will provide opportunities for intermediate and high school students to engage in some thinking, problem-solving, and judgment-making. What follows is a result of attempts to validate the appropriateness of the materials.

The first study concerned some materials we were developing for stimulating high school students to think about science. In this instance, the questions we asked were concerned with experimental design. Some 160 students from grades 10, 11, and 12 in a high school science program were asked to design an experiment to test the proposition (amongst others) that men are stronger than women. The rationale for choosing a topic such as this rather than one more clearly scientific is that we were concerned to find out what processes the students were able to transfer from their science classes without reference to specific content.

The major headings that we considered when analyzing the students' replies were five: number of subjects (i.e., men and women to be utilized in the experiment), sampling and control procedures, operationalization of terms, specification of procedures, and measurement of outcomes. We also looked at any notions of statistics, the ethics of experimentation, experimental bias, and feasibility.

The table summarizes in percentages the number of subjects the students proposed for the experiment.

Subjects	Grade			All grades
	10	11	12	
Not specified	22	28	50	28
1 pair	34	12	16	20
2 pairs	23	32	25	29
3–5 pairs	9	5	—	6
5–10 pairs	3	8	—	5
10+ pairs	9	15	8	12

Half of the students believed that a comparison between one or two pairs of men and women would be sufficient to determine the truth of the proposition. While the percentage decreases through the grades, almost half of grade 11 had this belief. Another 28% of the students either failed to mention any number at all or used such imprecise terms as 'a group,'

'several,' 'some specimens,' and 'a roomful.' This imprecision of language was persistent throughout the proposals.

In order to obtain the subjects, 5% of the grade 10 students, 24% of the grade 11 students, and 37% of the grade 12 students indicated some sort of sampling procedure. Examples of these were: 'Select five of the strongest men and the strongest women in the world,' 'Take different types of people,' 'Choose people of same height and weight.' In other words, the students showed at best a rudimentary and unsophisticated notion of the validity of the representativeness of their experiments.

The same was true of the operationalization of terms. In all, 5% of the grade 10 students, 23% of the grade 11 students, and 40% of the grade 12 students attempted to grapple with the problem of the construct of strength in the sense that either they indicated at least two dimensions of strength (endurance as opposed to bursts of power, mental as opposed to physical) or specifically proposed that strength was something that a testing procedure measured. Most left the definition of strength implicitly to the specification of procedures and the measurement of outcomes, although even here statements were extremely vague. For example, students suggested that the experimental subjects undergo 'tests of strength,' or 'physical exercises,' or 'several tests.' Only 19% of the grade 10 students, 14% of the grade 11 students, and 27% of the grade 12 students actually mentioned any tests at all. Where they were not the vague ones referred to above, they were normally limited to one specific test such as the lifting of heavy weights or the running of a mile. Consistent with the lack of sampling of subjects, there was almost a complete lack of sampling of test items.

With respect to measuring outcomes, only 40% of grade 10 students, 27% of grade 11 students, and 20% of grade 12 students made any attempt to indicate that if the test was, for instance, a competition between one man and one woman on one task, the criteria for greater achievement would be self-evident. Those who did describe outcomes tended to content themselves with statements such as 'Note results,' 'Observe who runs faster,' 'See which one wins.' Where the suggestion for the experiment allowed for several results (where, for example, there were several subjects and/or several tests), only three students suggested averaging the results. No other statistical manipulations were suggested. Interestingly, while not everybody mentioned outcomes, of those who did one-third implied in their response that the experiment would go the way they believed — 'Have a man and a woman pick up weights; increase the weights until the woman cannot pick up any more thus showing the man to be the stronger.'

I should like to make two speculations

about these results. The first is that the problem was inappropriate for the purpose of finding out anything about the students' notions of experimental design in that the content was too far removed from that with which they were used to working. Consequently we should not have expected any transfer from their science classes.

A second speculation takes the opposite view — that the students were transferring quite specifically their notions of scientific

experimentation from their labs and were describing in effect the recipe method of doing experiments. One sample of whatever is to be studied is sufficient for the experiment, and the outcome is predetermined because the book or the teacher says beforehand what is supposed to happen.

The second set of studies I would like to describe were carried out over the winter in three grade 8 classes near

Ottawa, although not all three classes were involved in all of the studies. While the findings relate to grade 8, I believe that some of the possible conclusions might well be applicable to most levels of teaching, particularly the high school level.

We used many kinds of problems involving physical manipulations as well as verbal brain-teasers. Some examples of the latter are shown, and I would like to comment on them.

The first interesting point we noted was the errors in reasoning of many of the students. For example, problems #4 and #6 involve negative statements, which caused considerable difficulties. In #4, one of the strategies for solving the problem is to consider each of the statements in turn as being the true one and considering the implications of that for the truth or falsity of each of the other statements, bearing in mind that only one statement can be true. The first difficulty arose when the students had to consider the possibility that B's statement is true. In this case they had considerable difficulty accepting the idea that B could be telling the truth when he says someone is lying. Then many students had difficulty following the reasoning 'A is lying (because B is telling the truth), therefore the statement "I didn't do it" is false, therefore A *did* do it' — the difficulty in this case being to see the implication of A's lying on the content of A's statement.

Similar difficulties arose with #6. Out of a class of 31 came the following distribution of answers:

	A	B	C
21	English	Canadian	American
2	American	English	Canadian
6	Canadian	American	English
2	English	American	Canadian
0	Canadian	English	American

The interesting fact here is that the majority of the students gave the one answer that was most wrong — i.e., the case in which all three statements of the waiter were correct. There are several explanations for such a response. One might be the kind of assumption with which the student tackled the problem: if he found one correct statement, for example, he would assume that the other two would be incorrect. In other words, instead of using the rule as a constraint he is using it as a self-fulfilling prophecy. A second explanation, which is simpler, is that the students again had difficulty with the negative, in effect ignoring it. Their reasoning would be that A is English is correct; B is Canadian, therefore he is not English — and so the waiter is wrong; C is American and so he is not Canadian and so the waiter is wrong. When we confronted the students with this issue, it seemed that this was indeed their reasoning.

The second set of errors concerns problems #7 and #8. We tried the problem of Jane's coins with two classes, 49

BRAIN TEASERS

1. Insert the missing number

4	8	20
9	3	15
6	6	—

(H. J. Eysenck, *Know Your Own I.Q.*)

2. Three persons are shown 3 red hats and 2 black hats. They are then seated in chairs placed in single file and blindfolded. A hat is placed on each person's head, the remaining hats hidden, and the blindfolds removed. One at a time, they are asked if each can guess the color of the hat on his own head.

The person who sits in the third chair is asked first, and he confesses that he does not know the color of his hat, even though he can see the hats on the heads of his 2 companions. The second person, who can see only the hat on the person in front of him, also admits he cannot guess his color. The first person, who can see no hats at all, says he knows the color of his hat and he is correct.

What color hat is he wearing, and how did he know?

3. A square table is constructed with an obstruction in the middle of it, so that when 4 people are seated one on each side, each can see his neighbors to right and left but not the person seated directly across. The 4 people seated at this table were told to raise their hands if, when looking to right and left, they saw at least one woman. They were also told to announce the sex of the one person whom they could not see, if it could be figured out logically.

Since, as a matter of fact, all 4 people were women, each raised her hand, but then several minutes went by before one of them announced that she was certain that the person seated opposite her was a woman.

How could she logically have come to that conclusion?

4. The police were convinced that either A, B, C, or D had committed a crime. Each of the suspects, in turn,

made a statement, but only one of the four statements was true.

- A said, 'I didn't do it.'
- B said, 'A is lying.'
- C said, 'B is lying.'
- D said, 'B did it.'

Who committed the crime?

5. I've seen Mary standing at the edge of the skating rink with skates on her feet. I've often seen her walking and running to school and standing about. I've seen her watching the skating at the rink, and she is always talking about skating.

- 1) Can Mary skate?
- 2) Why do you say that?

(E. A. Peel, *The Nature of Adolescent Judgment*)

6. Three men, A, B, and C, went out to dinner in Paris. One was Canadian, one American, and one English. The waiter was asked if he could guess their respective nationalities. He said that A was English, B was not English, and C was not Canadian. Only one of his answers was correct. What were the nationalities of A, B, and C?

7. Jane has three coins which all look the same. However, two of the coins are exactly the same weight, while the third is heavier than the other two. She also has a balance that will indicate which of the two objects is heavier or lighter or whether they have the same weight. Show how Jane could find which of the coins is the heavy one by using the balance *only once*.

8. Imagine that you have three boxes, one containing two black marbles, one containing two white marbles and the third, one black marble and one white marble. The boxes have been labeled for their contents — BB, WW, and BW — but someone has switched the labels so that every box is now incorrectly labeled. You are allowed to draw one marble at a time out of any box without looking inside. What is the minimum number of drawings required to say what is exactly in each of the boxes?

Answers will appear in the next issue of Orbit.

students in all. Only 13 students gave a complete answer, considering both possibilities and working out the implications of each case. Another 10 students gave a partial answer involving one of the possibilities and its implications. The other 26 students produced one of two answers:

1. Take the heavier coin and place it in one pan; put one of the other coins in the other one. The pan that goes down contains the heavier coin;
2. Take the heavier coin and place it in one pan; place both the other coins in the second pan.

You will recognize here two examples of Piaget's description of the concrete operational stage. In the first case (#4 and #6), the students have difficulty differentiating between the content of the statement and its context and thus have difficulty comprehending that someone can be speaking the truth when he says someone is lying. In the second case, the students have difficulty imagining things to be other than they are. Thus once one has chosen the heavier coin, it would be impossible that it should not indeed be the heavier coin.

The second area of interest was the students' expectations concerning answers. The most extreme example was elicited by #5, the problem concerning Mary and her skates, which is one of a series of such problems we tried. Again in two grade 8 classes, the answers were as follows: 14 students believed that Mary could skate, 33 believed that Mary could not skate, and 8 responded that they were unable to say. The interesting thing about doing this sort of problem is that while one can imagine all sorts of assumptions that supply the missing data, one could imagine situations relevant to either state of Mary's skating. This indeed was demonstrated by discussions that the students had amongst themselves in small groups made up, as far as possible, of students who held each of the three opinions.

A second and possibly related area was the method by which the students went about the problems. Typically, they began answering as soon as they had read the problem. For example, in the case of Mary, the thinking seemed to follow the order of the two questions asked — that is, the students first made a judgment and then looked for the evidence to support it. Similarly with #6 and #8, the students adopted the strategy of assuming an answer to be correct and then testing out the implications. Thus with #6 the students seemed to say, 'Let A be English, then B will be Canadian because C is not Canadian, and C must be American.' The reasoning in #8 was similar. Take a ball out of any box; let's say it is a black one. Take another ball out of the same box; let's say it is also black. You know where the two blacks are. Take a ball out of another box. If you are lucky (!) it will be black, so you know that that box contains

the black and white balls and you can tell that the third box contains the two whites.

The first point I am getting at here is that the students did not typically generate all the possible answers before beginning to eliminate any or before deciding on an answer. Thus, it was rare to hear students talking of the two possibilities of Mary being able to skate and Mary not being able to skate. Similarly, only 13 students out of 49 described the two possible outcomes if Jane selected any two coins and put them on the pans of the balance, while the others seemed to suggest the one possibility. In particular, in the problem of the black and white balls where it is essential to set out all the possibilities in order to solve the problem, it was not until grade 12 that I observed any students attempting this strategy.

The second point is that the students gained only the minimum of information from each piece of evidence. This is evident as a corollary of the first point: that is, apart from not setting up the possibilities in some systematic fashion, the students did not use the evidence that was already available to eliminate some of the possibilities. The most interesting problem in this respect is the one concerning the black and white balls, in which the challenge is to use as few attempts as possible in order to find out all the information. The major difficulty that I have found with this problem is to get the students to stop and reflect on the significance of each new datum as they have it.

Again, many of you will recognize here typical behavior of a concrete operational child. These students were bound to the concrete both in terms of the possibilities and in terms of their going beyond the immediate information. However, I do not accept without further study that it is altogether satisfactory to account for the difficulties of these students by saying that they were behaving appropriately according to a stage in development.

I would like to suggest that while it may well be the case that people do develop, as Piaget says, not only in terms of the sequence of stages but also in terms of the fairly broad age norms he has described, we know very little about the transition rules that govern the development from stage to stage. In particular, we know little about the effect of instruction on such development.

We might indeed attribute much of the behavior I have described to instruction rather than to the haphazard interaction between the youngsters and the environment. It is tempting to speculate that the sort of problem-solving behavior we observed is a reflection of the kinds of expectations that the students were being taught. First, with respect to the question as to whether Mary can skate, do the kinds of questions teachers pose to their students always have a definite answer and is there always sufficient information provided for the answer to be found?

Second, with respect to the other answers, are the kinds of questions teachers pose to students always answerable by adopting the most obvious strategy or by recalling some already learned fact? Third, how often do students confront a problem that requires them to generate and consider several possible solutions or several possible strategies for solution? Fourth, how often are students called upon to make inferences themselves, or do they always learn the conclusions along with the data or observe the teacher making the conclusions from the data?

During this year, we shall be looking at questions such as these. We shall also be investigating the effects of providing problems to students that allow them the opportunity to suspend judgment, to seek more data, to generate alternative hypotheses, and to make inferences.

In the meantime, I have to confess to a sense of disappointment when I look at many of the curriculum documents being produced in the province, and particularly those influenced by the reaction to the permissive spirit that pervaded education over the last five or so years. I too believe that there should be some specific objectives that teachers should be pursuing and for which the schools might be held accountable in terms of the students' learning. Nevertheless, I do not believe that such objectives can be stated principally in terms of the first two levels — recallable knowledge and algorithms. There are three fairly obvious reasons for this belief. First, there is so much knowledge that any selection from the existing collection has to be arbitrary, and one could be endlessly involved in a futile debate as to what knowledge is of most worth. Second, I believe that most teachers would not ultimately quarrel with this position insofar as they already look at the transfer potential of any topic that they cover rather than only at any intrinsic value. We are in fact seeing a great change in many of the traditional subject areas simply, I think, because teachers themselves recognize that subjects such as history or science are not being taught for their own sake but rather for some contribution that they will make to the students' adaptation to life when they leave school. Thus, for example, the emphasis is being taken off British and American history and being placed on Canadian studies or on social studies. Third, it has become a commonplace that, while in the past it was usually possible to predict what knowledge would be necessary to fit young people for a secure place in society, change has become such a constant component of our culture that it is now becoming impossible to be sure that any knowledge will not become redundant. The only thing that is certain is the prospect of change itself; consequently, the best preparation that one could give students would be a preparation to cope with change.

Ontario Ministry of Agriculture and Food

The importance of the agricultural industry has been brought sharply to consumer attention because of rising costs and the disastrous effects of variable weather conditions on harvests throughout the world.

It has taken time, but the urgency of maintaining adequate food supplies has now been realized. Through mechanization and other improvements, we must produce more food in order to feed as many people as well as we possibly can.

The consumers in your classroom are tied closely with what happens in the food production cycle, as are we with the Ontario Ministry of Agriculture and Food. Our aims are twofold: to help formulate policies and undertake research for the benefit of agriculture, and to keep consumers aware of changes in farming as they affect people both here at home and in our many foreign markets.

Our Information Branch performs the communications function for other branches of the Ministry. Designed basically to serve producers, consumers, businesses involved with agriculture, and news media, the branch distributes a wide range of information on a number of agriculture-oriented subjects.

publications (up to ten different titles) are available free of charge on request. Large-quantity orders are for sale only; quotations for such orders are available on request. A brochure, *1975 Publications*, outlines all printed material available through the Ministry. Inquiries for the publications list should be directed to:

Information Branch
Ontario Ministry of Agriculture and Food
Parliament Buildings
Toronto, Ontario M7A 1A5.



Audiovisual materials include a number of 16mm films and slide sets that have been produced by the Ministry of Agriculture and Food and made available to educators in Ontario on loan or for purchase. In addition to these, other films and slide sets have been collected from many sources in Canada and elsewhere. The topics deal primarily with agriculture, the production of food, and home economics. These are available to schools and other organizations. A complete catalog outlining all films and slides is available on request. For more information write to:

Film Library
Information Branch
Ontario Ministry of Agriculture and Food
Guelph, Ontario N1G 2W1.

Films

All films are 16mm, in color, with sound. The only cost to the user is return postage. When requesting films be sure to include alternative showing dates.

Beautiful Possibilities (19 minutes)
Under acres of glass and with a high degree of specialized tech-

nology, flower producers are involved in a multi-million-dollar industry — providing Ontario consumers with everything from tropical blooms and African violets to common bedding plants. An ideal film for introducing floriculture to secondary school students.

Color Me Golden (14 minutes)

The story of corn, one of man's first food staples, from seeding and harvesting through processing to serving. Produced for a general audience.

Heed the Label (23 minutes)

Stresses the importance of the instructions on the labels of pesticide containers. The film alerts users of pesticides to the safety factors involved in using dangerous and toxic chemicals. A good instructional film for all audiences.

The Inside Story (23 minutes)

Fresh Ontario vegetables are often available to consumers before winter's snow has disappeared. The Ontario greenhouse industry makes it happen. This nontechnical but highly informative film relates all facets of greenhouse vegetable production from seed to salad. Suitable for use in secondary schools.

Ontario North — A New Day (13 minutes)

The New Liskeard College of Agricultural Technology plays an important role in the agriculture of northern Ontario. This film shows how the college deals with some of the special problems of northern

agriculture and tells of the various courses offered and the community services provided by the college students and staff. For all audiences.

A Taste of Honey (6 minutes)

This educational film presents the honeybee as an approachable and beneficial insect. With catchy rhyming narration the film tells the story of honey, with the beekeeper and his bees in the starring roles. The activities of the queen bee, the drones, and the workers are explained. For elementary school audiences.

Slide Sets

Each slide presentation consists of 35mm slides accompanied by a written script and an audio tape. Specify whether you prefer an audio cassette or reel-to-reel tape.

The Holland Marsh (104 slides)

An ice age and thousands of years of flooding have developed the black organic soil of the Holland Marsh. Located at the southern tip of Lake Simcoe near Bradford, the marsh has been developed into the 'vegetable garden of Ontario,' where millions of dollars worth of carrots, celery, onions, and lettuce are grown yearly. This set relates the history of the marsh and explains the problems faced by its farmers. Suitable for all audiences interested in learning more about the Holland Marsh.

Ontario Cheddar Cheese (64 slides)

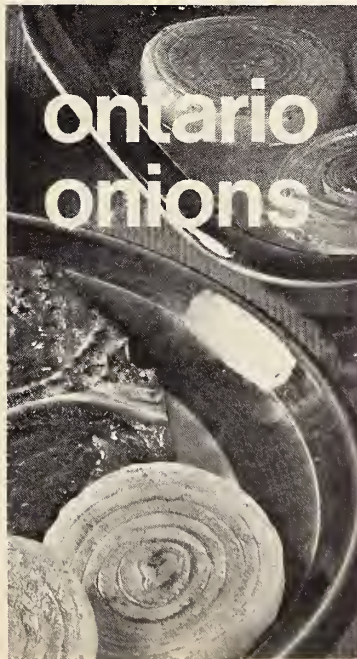
Gives a behind-the-scenes look at the production of Cheddar cheese. The nutritional value of cheese is compared with the values of other foods. This set will be of interest to home economics classes.

Ontario Maple Syrup (75 slides)

Designed to introduce people to Ontario's maple syrup industry. A historical outline of the making and uses of maple syrup is followed by an explanation of the scientific innovations of modern maple syrup production. For all elementary and secondary school audiences.

Pesticides and Their Safe Use in and around the Home (48 slides)

Designed to make both children and adults more aware of the need for safety practices in the handling of pesticide chemicals. Includes advice on where and when to use pesticides and how to store and dispose of the containers. Produced for a general audience.



Origin, Classification and Use of ONTARIO SOILS



Teaching Aids Available

To inform and to educate young people about the changes in and problems of agriculture as an industry, the Ontario Ministry of Agriculture and Food offers several services.

Publications cover such subjects as crops, livestock practices, animal health, and other related topics. Single copies of these

St. Andrew School, Thunder Bay

An open-plan school that makes extremely effective use of its spacious architecture is St. Andrew in Thunder Bay. Under the aegis of the Lakehead District RCSS Board, St. Andrew has a long history dating back to the turn of the century. But in 1971 a new structure was built in a different location, and apart from a few separate rooms for staff and for craft activities, it consists of one gigantic carpeted floor. There are 320 students, from junior kindergarten to grade 6, and fourteen teachers.

St. Andrew offers the kind of integrated learning experience of the old one-room schoolhouse but without the disadvantages of a solitary teacher and close confinement. The open space encourages team teaching and cooperative teaching, which in turn is reflected in a cooperative attitude among students of all ages. Immigrant students with language difficulties find it particularly easy to make friends. Discipline is less of a problem because it is a shared responsibility.

In the primary area, the morning is devoted to skill development — language and mathematics — and the afternoon to themes and science. In the junior area, themes occupy the whole day, with basic skills woven into the thematic fabric. Some theme titles have been Survival, Coins, the Philippines, and Animals. Individual students may work on their own themes, but more often it is a team effort.

In so many open-plan schools, there are invisible barriers that compartmentalize the space just as completely as walls. At St. Andrew, it is truly open.



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